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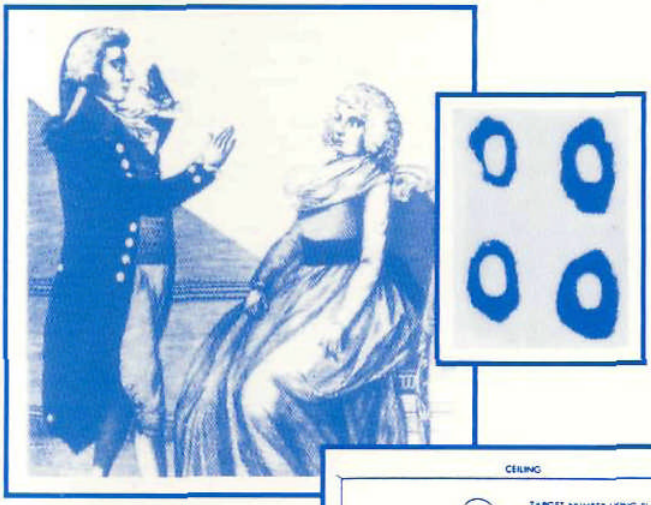
EVALUATING CONTROVERSIAL CLAIMS



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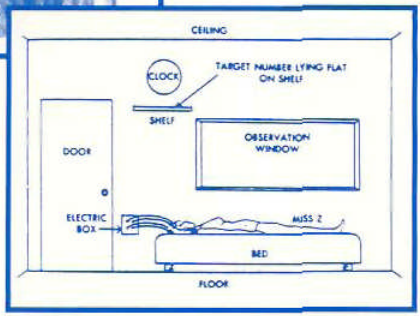
Testing ESP

Catching Chinese Psychic



The Remarkable 'Remembering Water' Affair
Science & Uncertainty / Kirlian Controls

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THE SKEPTICAL INQUIRER is the official journal of the Committee for the Scientific Investigation of Claims of the Paranormal.

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Manuscripts, letters, books for review, and editorial inquiries should be addressed to Kendrick Frazier, Editor, THE SKEPTICAL INQUIRER, 3025 Palo Alto Dr., N.E., Albuquerque, NM 87111.

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SPECIAL REPORT: THE 'REMEMBERING WATER' CONTROVERSY

132 **Water With Memory? The Dilution Affair** *by Martin Gardner*

142 **The Case of the Remembering Water** *by James Randi*

145 **Bibliographic Guide to the 'Dilution' Controversy**

ARTICLES

147 **Pathologies of Science, Precognition, and Modern Psychophysics** *by Donald D. Jensen*

161 **A Reaction-Time Test of ESP and Precognition** *by Terence M. Hines and Todd Dennison*

168 **Report of a Chinese Psychic's Pill-Bottle Demonstration** *by Wu Xiaoping*

172 **The Kirlian Technique: Controlling the Wild Cards** *by Arleen J. Watkins and William S. Bickel*

185 **Certainty and Proof in Creationist Thought** *by Joseph E. Laferrière*

NEWS & COMMENT

114 CSICOP Wins in Hawaii Court / Hurkos, in Death as in Life / Shroud Proved Medieval / Abominable Snowman Photo / Chiropractor Settles Out of Court / CSICOP and Skeptics Groups / Aid for Quackery Victims / Short-Term County Astrologer / Conference for Journalists / Spider-Man / *Dianetics* Special Edition / Senator Pell and Psi Research / New Twist for Psychic Poll

PSYCHIC VIBRATIONS

129 Astrology East and West and UFOlogy's "Mr. Ed" *by Robert Sheaffer*

BOOK REVIEWS

189 Michael Crichton, *Travels* (Barry Karr)

191 Ivan Stang, *High Weirdness By Mail* (Brian Siano)

193 Charles Berlitz, *The Lost Ship of Noah* (Al Martin)

196 R. C. Finucane, *Appearances of the Dead: A Cultural History of Ghosts* (Erik Strommen)

199 **SOME RECENT BOOKS**

200 **ARTICLES OF NOTE**

FOLLOW-UP

203 Morphic Resonance in Silicon Chips *by Rupert Sheldrake* (with a response by Francisco Varela)

FORUM

206 Crystals: Icons of Nature's Design *by Chet Raymo*

211 Ghostbusting *by Henry Gordon*

213 Where Science and Poetry Meet *by Ron Ellis*

214 **FROM OUR READERS**

Cover design by Lisa Mergler.

News and Comment

CSICOP Wins Hawaii Court Case

THE COMMITTEE for the Scientific Investigation of Claims of the Paranormal has won a court case brought against it in Hawaii. The suit, the first and only one brought against CSICOP in the 12 years since its inception, was closely watched by both critics and supporters of the paranormal.

All contentions of the suit were dismissed by the court. In addition, the plaintiff, Gharith Pendragon, was ordered to pay sanctions to CSICOP and other defendants.

The suit emerged from criticisms of Pendragon and many of his claims following his advertisement offering four courses in 1986 in the noncredit program of Windward Community College, part of the University of Hawaii. The courses, on psychic phenomena, included "Mastering Clairvoyance" and "Developing Telepathy." The ad made strong claims. Pendragon promised to aid the student in developing clairvoyant skills, said telepathy had been documented around the world, and said he would teach how to increase one's telepathic skills.

Pendragon originally claimed to have a master's degree in psychology and to be a "licensed clairvoyant and psychic." He offered a class in "psychic self-defense" that would provide "protection against invading minds" and enable one to achieve "auric control against auric attacks," to break "unwanted psychic links," and to stand "protected in haunted areas." (He later admitted that he did not have a master's degree and that his "license" was in fact just an excise tax license.)

Pendragon's assertions brought strong criticisms from several members of a then newly formed group called the Hawaii Skeptics and academics at the University of Hawaii. In some of these statements, members of the Hawaii Skeptics incorrectly represented this local group as an official chapter of CSICOP, and thus CSICOP's name appeared in connection with the criticisms of Pendragon. At the time CSICOP was not even aware of the controversy.

In October 1986 Pendragon issued a writ against CSICOP, CSICOP chairman Paul Kurtz, and James Randi (all called "the CSICOP defendants"), the University of Hawaii, academics at the university, the Hawaii Skeptics, and individuals associated with that group. He said that as a result of these statements the university canceled some of his noncredit courses and refused to hire him to teach others. He claimed defamation, interference in contractual relations, civil conspiracy, and violation of his rights.

On October 27, 1987, the court dismissed all Pendragon's claims against the University of Hawaii and other university defendants in their official capacity. The dismissal was on grounds that the suit

was barred by the doctrine of sovereign immunity.

The remaining university defendants moved for summary judgment (dismissal). A hearing was held in U.S. District Court before Judge Harold M. Fong, August 23, 1988. On September 1, Judge Fong ruled in favor of the defendants on all contentions.

CSICOP officials were named, directly or indirectly, as defendants in the conspiracy claims. The court ruled that the exhibits Pendragon offered did not raise an issue of fact concerning a conspiracy. The court ruled further that Pendragon had failed to produce evidence of any civil rights violations. The judge added that even if Pendragon had raised an issue of fact, the CSICOP defendants were still entitled to a summary judgment because Pendragon was a public figure and no malice had been demonstrated. The court granted summary judgment in favor of the CSICOP defendants on all of Pendragon's claims.

Judge Fong complained that Pendragon's responses to CSICOP requests served on him in its defense were vague and incomplete. He added that Pendragon refused to answer certain interrogatories in spite of the magistrate's order to do so. The judge ruled that Pendragon had no reasonable excuse for his continual refusal to answer three particular interrogatories and that he was required to answer them.

These interrogatories involved CSICOP's request for Pendragon's evidence demonstrating that he in fact possesses psychic powers. Pendragon had claimed that he had been defamed by criticisms that he did not possess the powers alleged. But truth is an absolute defense in defamation claims. So the judge ruled they were entitled to discover whether or not he had such powers.

The court found that Pendragon's refusal to answer these three interrogatories, and his vague and incomplete responses to other discovery requests, demonstrated callous disregard that justified dismissal. Indeed, the judge found that Pendragon's conduct demonstrated a remarkable lack of respect for the discovery process and for the defendants' right to defend themselves against his accusations.

"The court strongly suspects that Pendragon maintained this suit in order to chill defendants' exercise of their rights, rather than to vindicate his own rights," wrote Judge Fong.

Federal rules allow the defendants to move for sanctions, to recover attorneys' fees and costs. The court's review of the record disclosed that Pendragon had frequently engaged in sanctionable conduct in the prosecution of his lawsuit. Judge Fong found that the record was replete with examples of Pendragon's frivolous arguments and filings. Under these circumstances, he ruled the court had no choice but to impose sanctions.

He ruled the university defendants were entitled to recover fees and costs totaling $4,212; the CSICOP defendants were entitled to recover fees and costs totaling $3,975, in addition to earlier imposed sanctions of $1,931.

Thus Pendragon lost on all contentions, and his paranormal claims remained unproved.

"Had it gone to trial," says CSICOP Executive Director Mark Plummer, a lawyer, "Pendragon's expert witnesses would have been cross-examined as to the likelihood of Pendragon's being able to develop students' clairvoyancy, telepathy, and psychic abilities. They would also have been cross-examined on psychic self-defense, achieving auric control against auric attacks, and standing unprotected in haunted areas.

"It would have made an interesting case," said Plummer.

—*K.F.*

This report is based on a longer summary of the case available from the CSICOP office.

Hurkos, in Death as in Life, Encourages Idea He's Psychic

WHEN "psychic" entertainer Peter Hurkos died in Los Angeles June 1, 1988, at the age of 77, news stories and obituaries unskeptically relayed claims that he had helped police solve crimes and otherwise demonstrated phenomenal psychic abilities.

The news coverage, apparently relying heavily on information supplied by Hurkos's publicist, Barbara Silver, reported as fact a number of exaggerated or discredited claims about his career.

Both an Associated Press article and a *Los Angeles Times* obituary ("Peter Hurkos: Detective Who Used Psychic Powers," June 2), for instance, claimed that Hurkos helped authorities in investigations of the 1969 murders by the Charles Manson family of actress Sharon Tate and supermarket owner Leno La Bianca and his wife, Rosemary.

The facts are somewhat different. Melanie Nickel of San Diego and magician/investigator David Alexander of Los Angeles were among those who pointed out serious discrepancies. As Nickel reminded the *San Diego Tribune* in a letter to the editor (June 8): "On the contrary, according to *Helter Skelter,* the definitive Manson book, by Vincent Bugliosi and Curt Gentry, Hurkos never had any contact with the police or other authorities. He did give a private 'reading' but it was neither accurate nor helpful."

The book relates that Hurkos was hired by friends of murder victim Jay Sebring to visit the Tate murder site. He gave a "reading" and announced to the press that the murders were committed by three men, whose identity he claimed to know, and that the killers and victims had been participating jointly in a black-magic ritual when the three men freaked out on drugs and killed the others.

"All this proved to be utter nonsense," writes Nickel, "not even close to the actual facts of the murder in any way, and the police ignored it. At no time did Hurkos have anything to do with the investigation of the Bianca murders, which has apparently not stopped his publicist from claiming that he did. Let this serve as a reminder to readers that they should read such stories with a healthy skepticism."

Nickel concludes by chiding the *Tribune* for being "fooled into printing the self-serving claims of a professional 'psychic' as if they were fact."

Alexander also saw a certain irony in the reports upon Hurkos's death. As he wrote in a letter to the *Los Angeles Times,* "The obituary of Peter Hurkos seemed to do for him in death what was never done in life, that is, validate his alleged psychic powers. Whenever Hurkos's claims were critically investigated, they vanished."

Alexander reported a case in point. Journalist Chuck Ashman hosted a locally produced program, "The Ashman File." Some months after the disappearance of Jimmy Hoffa, whose family Ashman knew, Ashman had Hurkos on the program. He gave Hurkos items that he identified as belonging to Hoffa, including a shirt he said Hoffa had worn.

"Sure enough," said Alexander, "Hurkos picked up the shirt and started 'psychometrizing' on Hoffa's vibrations. Hurkos gave descriptions of what hap-

The 'Shroud' of Turin Found to Be Medieval

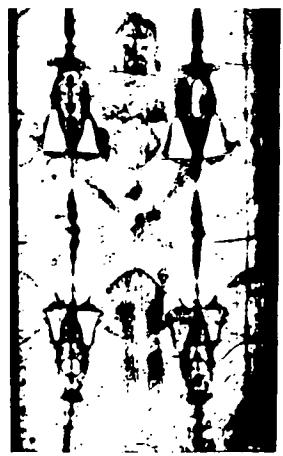
A CRUCIAL—potentially final—episode in the controversy over the Shroud of Turin began on April 21, 1988, when an 0.4-inch by 2.8-inch strip was snipped from the linen cloth. The strip was then subdivided into three smaller pieces, one each for the laboratories chosen to conduct the carbon-14 dating tests: Oxford University, the University of Arizona, and the Swiss Federal Institute of Technology in Zurich.

In an attempt to rule out bias, each lab was given three cloth samples of known date along with its shroud specimen, and all swatches were simply numbered so that the tests—by accelerator mass spectrometry—would supposedly be "blind." With the British Museum acing as "certifying institution" for the results, the scientists were further constrained by a secrecy pledge.

However, although the samples were contained in identical steel boxes, the shroud's distinctive herringbone weave insured that its sample could be easily identified. Not surprisingly, therefore, leaks began to occur soon after the test results were obtained.

It was not until August 26, however, that the *London Evening Standard* reported, without attribution, that Oxford scientists had determined that the shroud dated from circa A.D. 1350—about the time of a reported forger's confession. Dr. Richard Luckett of Cambridge University was quoted as saying, "I think that as far as seems possible the scientific argument is now settled and the shroud is a fake."

One spokesman for the Archbishop of Turin termed the report "all nonsense," but further leaks were to follow. In less than a month, the *Sunday London Times,* citing unnamed sources, reported that test results revealed a date between 1100 and 1500. Soon after, the



The 'shroud'—dated between 1260 and 1390.

Reverend Robert Dinegar of the Shroud of Turin Research Project (STURP), disclosed that all three laboratories had obtained results within a 200-year range, and he hinted at a mid-fourteenth-century date. His information, according to the *Los Angeles Times,* came from an "authoritative source."

An official announcement was about all that remained, and that came on October 13. The Archbishop of Turin announced at a news conference that the test by three laboratories put the date between A.D. 1260 and 1390. Thus, he said, the cloth is no more than 728 years old and cannot be the burial shroud of Christ.

However, shroud enthusiasts continue to emphasize the supposedly inexplicable quality of the image on the cloth. Some refuse to accept the scientific findings, while others imply that the cloth is not a miraculous shroud but may be a miraculous icon—notwithstanding the lack of historical record, the forger's confession, the presence of paint, and other evidence.

—Joe Nickell

pened during Hoffa's last days, where he currently was, and many other details. There was little equivocating, as was normal with a Hurkos performance. He made definitive statement after definitive statement. It was clear he was sure of his information.

"The blow off came during the last 90 seconds of the program, when Ashman identified all the items as belonging to him, not to Hoffa. Nothing there had ever been owned or touched by Hoffa. The shirt that gave Hurkos such strong 'Hoffa vibes' came from Ashman's closet and had never been within 2,000 miles of Jimmy Hoffa.

"Hurkos sat stunned as the set went to black and the program credits rolled," concludes Alexander. "I called Ashman the next day and asked him for Hurkos's reaction after they went off the air. Ashman said Hurkos voiced a rude description of Ashman's parental lineage and stormed off the set."

The SKEPTICAL INQUIRER published an article about Hurkos in 1978 (vol. 3 no. 1, reprinted in *Paranormal Borderlands of Science,* Prometheus Books). Titled "Sleight of Tongue," it consisted of an examination by clinical psychologist Ronald A. Schwartz of Hurkos's "cold reading" methods in one particular radio call-in performance. Schwartz vividly demonstrated how Hurkos managed to make vague general statements about callers seem, even to the callers, to be specific and accurate. "It is curious that the gull unwittingly tries so hard to get duped," writes Schwartz. "He often goes to considerable lengths to make the stimulus intelligible and in accord with something from his experience."

"Did you lose your bracelets?" Hurkos asked a woman.

"I did lose a . . . [pause]," she said.

"Did you got it too?" he said.

"I got a pin. Yes, I lost a pin," she answered.

Commented Schwartz: "Loss of bracelet confirmed by loss of pin!"

Hurkos was hardly above badgering his subjects into acquiescence.

"When did Mommy went to the doctor? When?" demanded Hurkos.

"Last—" the woman began.

"September," Hurkos interrupted.

"—week," she continued.

"No, no you are wrong!" Hurkos shouted.

"Maybe, I might be wrong," she said.

As Schwartz concluded in his article, "The eagerness with which people latch on to the fanciful idea of extrasensory perception to explain the apparent accuracy of the utterance, rather than to the recognition of their own complicity, is the really intriguing aspect of the demonstration. . . . Our persistent delight with fanciful explanations suggests that skilled practitioners of sleight of tongue will enjoy a bright and prosperous future."

—*K.F.*

Abominable Snowman Photo Comes to Rocky End

IN MARCH 1986, Anthony Wooldridge, a British physicist, spotted and photographed what he believed to be the Abominable Snowman, or Yeti. The photo was taken in the Himalaya Mountains along the India-Tibet border, where sightings of the manlike monster date back to 1925.

Unlike its North American look-alike, Bigfoot, the Yeti has effectively eluded photographic evidence—at least until the Wooldridge photo. The photograph was first shown in the United States at the annual dinner of the American Alpine Club's New York section. *Backpack* magazine called it the "best-yet evidence" for the Yeti, and even the *New York Times* ran an article about Wooldridge and his photo. In its 1986 year-end journal the International Society of Cryptozoology (ISC) ran a 14-page report and discussion of the photo, complete with enlargements,

digitally processed image analysis, and an artist's interpretation.

Not everyone viewing the photo has found it convincing. Freelance writer Jamie James described the "Yeti," appearing against the mountainous backdrop, as "a tiny fleck of darkish fuzz." The *Times* called it "ambiguous" and "vaguely human." Rene Dahinden, a veteran Bigfoot investigator, called it "totally unconvincing." Grover Krantz, certainly no skeptic, flatly rejected the notion that the photo was that of a Yeti.

All speculation about the photograph seems about to end. Recent photogrammetric analysis indicates that the "Yeti" was nothing more than a rock outcropping. Wooldridge has, much to his credit, conceded that the photogrammetric evidence "demonstrates beyond a reasonable doubt that what I had believed to be a stationary, living creature was, in reality, a rock."

In a letter in the ISC journal, *Cryptozoology* (vol. 6:135-137), Wooldridge said further support for this negative conclusion came from a photograph of the slope taken at his request in late summer 1987 by a local inhabitant. With no snow, "there *is* a conspicuous rock feature on the slope. . . . These two new pieces of evidence make me concur . . . that, in 1986, I mistook a rock for a living creature." Adds Wooldridge, "Naturally, I am very disappointed by the implications of the photogrammetric results. I had hoped they would support my original opinion that I had seen and photographed a Yeti."

—*Michael Dennett*

Chiropractor Pays $1,000 To Avert Libel Suit

A TACOMA, Washington, chiropractor has paid $1,000 and apologized for "inaccurate paraphrasing" in a letter published last year in a chiropractic newspaper. The letter, written by Ronald G. Cronk, D.C., to *Dynamic Chiropractic,* claimed incorrectly that psychiatrist Stephen Barrett had been "declared unbalanced and a propagandist regarding chiropractic by a panel of eminent investigators."

Dr. Barrett, who practices in Allentown, Pennsylvania, is also a professional writer and is co-chairman of CSICOP's subcommittee on paranormal health claims. He recently wrote two articles for *SI* about homeopathy (Fall 1987, Winter 1987-88). "Dr. Cronk was upset about a letter in which I had advised *Prevention* magazine's readers to steer clear of any chiropractor who does hair analysis, prescribes and sells megadoses of vitamins, urges all patients to have 14" × 36" full-spine X-rays, or claims that weekly or monthly spinal adjustments are needed to ensure health. The letter also offered a free copy of the National Council Against Health Fraud's position paper on chiropractic—which over 1,500 readers requested," Barrett said.

"After seeing my letter, Dr. Cronk complained to *Prevention* and urged *Dynamic Chiropractic*'s readers to attack me with quotes from the 1979 *New Zealand Report on Chiropractic,* in which something I wrote had been criticized. He suggested that the report could be used to persuade people that I am 'a propagandist with little regard for the truth.' Dr. Cronk misinterpreted the report and libeled me in the process. The newspaper's editor compounded the problem by accusing me of hating chiropractors and asking his 50,000+ readers to consider boycotting *Prevention* if it continued to allow me to be published.

"My attorney suggested that instead of filing suit, we inform Dr. Cronk why we believed a libel suit would be successful. Among other things, we pointed out that even the judge who ruled against the AMA in the chiropractic antitrust case had concluded that the *New Zealand Report* was untrustworthy. Dr. Cronk and his attorney responded with a rea-

CSICOP, Groups, and Spokespersons

WE WOULD like to provide the following information to our readers about the organizational nature of the Committee for the Scientific Investigation of Claims of the Paranormal, the relationship of CSICOP to the local, regional, and national groups listed in the SKEPTICAL INQUIRER, and who may or may not speak for CSICOP.

Because our organization has formalized over the years, a historical perspective is necessary.

CSICOP was formed by Paul Kurtz in May 1976 as a committee of interested scientists, scholars, journalists, and other skeptics. Soon afterward, the Executive Council was established and 35 Fellows were appointed.

In 1977 the first subcommittee (the UFO Subcommittee) was established. Also in 1977, an initial list of 23 Scientific Consultants was published in the SKEPTICAL INQUIRER.

In 1978 committee sections were established in four countries. They became known as International Committees, but are now described as National Groups and are independent and autonomous. There are now national organizations in 18 countries. Two of these national organizations predated CSICOP. Also in 1978 CSICOP became incorporated, with the Board of Directors and the Executive Council holding ultimate responsibility.

In 1980 the first two local U.S. organizations sharing the aims of CSICOP were founded.

As the work of CSICOP became better known, the number of subscribers to the SKEPTICAL INQUIRER increased, new Fellows were elected, and additional Scientific and Technical Consultants were appointed. Other skeptics formed new local, regional, and national groups with aims similar to CSICOP's.

CSICOP agreed to help these new groups through informal networking and information sharing. CSICOP decided, however, not to authorize any of these groups or their spokespersons to speak or act on behalf of CSICOP. Thus neither CSICOP nor members of the Executive Council are to be held responsible for any actions of local skeptical groups or their spokespersons, or for those of subscribers to the SKEPTICAL INQUIRER.

Consequently, at the meeting of the Executive Council on December 9, 1982, CSICOP clarified its position that local, regional, and national groups that share CSICOP's goals would be listed in the SKEPTICAL INQUIRER but were autonomous, not officially or unofficially affiliated with CSICOP, and not authorized to

sonable offer of settlement, which we accepted."

Barrett has been investigating chiropractic for 20 years. "Although I am critical of its shortcomings, I do not 'hate' chiropractors. I enjoy cordial relationships with many of them and am a consultant to the National Association for Chiropractic Medicine, a group trying to make chiropractic more scientific. A few years ago, the American Chiropractic Association's journal published a five-page interview of me—and this year I addressed the Association's House of Dele-

speak for CSICOP. This policy was reaffirmed at the Executive Council meeting on November 14, 1986, and continues to be in effect.

New groups become listed in *SI* in one of two ways. First, when CSICOP is informed of the desire of qualified individuals to form a local or national group, it may help by writing to SKEPTICAL INQUIRER subscribers in that city, region, or country in order to assist in convening an initial meeting. Once the group is formed it is independent and autonomous, and it is then listed in *SI*. CSICOP cannot interfere in its operations, reorganize it, or disband it. If it becomes defunct or takes actions contrary to the expressed objectives of CSICOP, then CSICOP may cease to cooperate with the group and drop its listing from the SKEPTICAL INQUIRER.

The second way a group becomes listed in the SKEPTICAL INQUIRER is when an already established or newly formed organization approaches CSICOP and asks to be listed.

Before CSICOP lists an applicant organization in the SKEPTICAL INQUIRER it must first be assured that the group is a viable organization, with a written constitution, a charter or bylaws, and an established ruling body, that is, a Board of Directors or an Executive Committee, with scientific representation and with goals similar to CSICOP's. CSICOP may also consult with any other groups in the area covered by the applying organization for their opinions as to whether or not we should list that new organization.

Groups appoint their own spokespersons, but these people cannot speak for CSICOP. Neither members of groups nor subscribers to the SKEPTICAL INQUIRER are entitled to speak or act on behalf of CSICOP or to describe themselves as members of CSICOP. Thus CSICOP's role relative to other groups is simply to cooperate with them and suggest methods and techniques of development when requested. CSICOP will not hesitate to vigorously criticize any group that engages in libelous or unethical conduct and to withdraw from any association with such a group or such actions. CSICOP disapproves of the practice of individuals' writing protest letters and putting "CC: CSICOP" at the foot of the letter.

The only spokespersons for CSICOP are the Chairman and other members of the Executive Council. The Executive Director, designated staff and other individuals may be authorized to speak for CSICOP on particular subjects. The Chairman of each subcommittee may also be authorized to speak on CSICOP's behalf on topics covered by the subcommittee.

MARK PLUMMER
Executive Director, CSICOP

gates on 'How Your Critics Perceive You.'

"I don't care if chiropractors disagree with me and argue with what I say," Barrett added, "but I won't tolerate being libeled." Ten years ago he sued a Pennsylvania chiropractor who had stated in a local newspaper that Barrett was "a psycho psychiatrist who has dedicated his life to witch-hunting the chiropractic profession" and was "paid to spread half-truths and lies out of context." The case was settled out of court within three months with a $500 payment and a retraction.

Barrett's attorney is Michael Botts, of Kansas City, a former assistant attorney general of Iowa who specializes in health-fraud cases.

NCAHF Task Force on Victim Redress

VICTIMS of quackery often have difficulty obtaining redress through the courts. Many are afraid of lawyers. Some are embarrassed at having been fooled. All too often the victim does nothing, simply dismissing the fraud as one of life's lessons. Health and nutrition frauds are new subjects for most attorneys. Although the same general law applies, most lawyers have had no experience in dealing with such cases. Because this practice is a specialty, dedicated, knowledgeable attorneys can be difficult to find.

The National Council Against Health Fraud (NCAHF) Task Force on Victim Redress will help victims of quackery obtain competent legal assistance. It will also serve attorneys as a clearinghouse for available information on the latest frauds and the experts who can help them prove their cases. Help will also be available to insurance companies and law-enforcement agencies.

Services offered by the NCAHF Task Force on Victim Redress include:

- A lawyer referral service for the public (i.e., a nationwide listing of attorneys interested in representing victims of quackery).
- A listing of unproved, fraudulent, and potentially dangerous treatments.
- A registry of expert witnesses.
- Information on defense witnesses.
- Reports on cases adjudicated, settled, or in progress.
- Class action suits by defrauded victims.

Those wishing to register with the task force as attorneys, victims seeking redress, victims willing to serve as witnesses against quacks, or expert witnesses in some aspect of quackery, or to supply useful information, can contact: Stephen Barrett, M.D., P.O. Box 1747, Allentown, PA 18105, 215-437-1795; *or* Michael Botts, Esq., P.O. Box 33008, Kansas City, MO 64114, 816-444-8615.

She Was an Astrologer For the County, Briefly

A COUNTY astrologer? Jenny Nicholson was appointed astrologer for Union County, Oregon, last summer, but she resigned five days later amid a storm of controversy.

It all started when the commissioners of Union County, at their regular meeting in La Grande, in northeastern Oregon, created the post of county astrologer and named Nicholson to it. They were eager to have her astrological advice on the right time to apply for federal and state grants.

"What the heck," said County Judge John Howard, a member of the commission. "If the Reagan administration is

rumored as using astrology, I guess we can try it on the local level as well." After the appointment, Nicholson told the Associated Press she intended to offer the astrological advice on a voluntary basis. She said she had been practicing astrology for 20 years and had a list of important clients. She said there was a place for astrology in government. "There are cycles. There are heavenly rhythms." Commissioner Bill Deering, who nominated Nicholson, said he didn't think it would do any harm.

Nicholson's moment in the stars was brief. National and local publicity, including criticism of the decision by the local newspaper, led to quick reconsideration. Five days after she was given the volunteer job and the day before the commissioners planned to rescind the appointment, Nicholson resigned. The commission went ahead and rescinded the appointment anyway, by a 3-0 vote. She said she had been made to look foolish.

But she didn't complain too vigorously. The controversy, said Nicholson, "has given me so much publicity and so many new long-distance clients that I no longer have time to be your volunteer."

—*K.F.*

Conference for Journalists Focuses on Pseudoscience

EDITORS and news directors usually send general reporters, rather than science writers, to cover local reports of paranormal or other strange phenomena and claims of medical cure-alls. Too often a lack of experience and knowledge in dealing with such unusual claims results in credulous news stories based mostly on reporting the words of proponents.

In September, the Los Angeles-based Foundation for American Communications (FACS), the Gannett Foundation, and the *Detroit News* sponsored a science-issues conference for working journalists, "Science, Pseudoscience and Quackery: Knowing the Differences." The conference, in Dearborn, Michigan, was presented in association with the Michigan Press Association, the Michigan State Broadcasters Association, and the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP). FACS is a national nonprofit educational organization dedicated to improving the quality of information reaching the public through news.

The "faculty" of the weekend conference, held September 23 to 25, included: Eugene Emery, science reporter for the *Providence Journal,* on "Science Reporting: A View from the Trenches" (several of Emery's articles have appeared in the SKEPTICAL INQUIRER); psychologist Ray Hyman, University of Oregon, Mark Plummer, CSICOP executive director, and Kendrick Frazier, editor of the SKEPTICAL INQUIRER, in a morning-long session on "Science and Pseudoscience: The War for Common Sense"; Mark Bloom, managing editor of *Physicians Weekly* on "Medical Reporting: It's a Minefield Out There"; Stephen Barrett, M.D., on "Medicine and Quackery: From Harmless to Deadly"; sociologist Dorothy Nelkin, of Cornell University and New York University, on "The Scientist as Salesman: Caveat Emptor"; and Temple University mathematician John Paulos on "How to Think About Numbers: A Mathematician to the Rescue." The conference concluded with a Sunday morning panel discussion on "Understanding and Covering Science."

In addition to its specific focus on pseudoscience and fringe science, the conference dealt with the more general issue of how to assess claims by sources both outside and within science.

About 30 reporters and broadcast journalists attended the workshop, the first on the subject ever held by FACS. They, FACS officials, and program organizer Sandy Blakeslee, a *New York Times* West Coast science reporter and

the FACS science advisor, all gave generally positive marks to the conference.

—*K.F.*

Zowie! Spider-Man Challenges Psychic Surgery Charlatans

IN *Web of Spider-Man* #41 (August 1988), Marvel comics reveals how psychic-healing charlatans (like Arigo) can "operate" on a patient.

A little background: Betty, an old friend of Spidey's, has fallen into a cult—the "Students of Love." He infiltrates it to see what's going on (not in costume, of course). At the same time, two of Betty's friends are talking to a reverend who has seen the cult in action. As the reverend explains phony psychic surgery, Spidey is seeing it done.

The reverend explains how even a careful, rational person can be fooled by the artifice: ". . . The magician says, 'I'm going to trick you,' and proceeds to do so. You know you're being fooled all along. But the charlatan, without flashing

"HE THEN REMOVES THE CANCEROUS MATTER"..
"ACTUALLY, IT'S JUST THE BALLOON THAT HAD THE 'BLOOD' IN IT. BY NOW, THOUGH, IT'S A 'BLOOD-COVERED' MESS AND UNRECOGNIZABLE.
"SPLENDIDLY HIDEOUS, THOUGH.
"HE THEN DISPOSES OF THE BALLOON AND TAKES THE OPPORTUNITY TO PALM MORE CANCEROUS MATTER--
"..BITS OF STEAK, CHICKEN-LIVER, THAT KIND OF THING--
"THEN, UNLESS YOU'VE MADE A THOROUGH STUDY OF HOW CHARLATANS OPERATE...
"YOU'LL BE SUCKERED"
I'M NOT SAYING YOU'LL BUY INTO THE WHOLE THING RIGHT OFF. BUT YOU DON'T HAVE TO.
ALL THEY NEED TO DO IS PLANT THAT INITIAL BELIEF IN YOUR MIND.."

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lights and lovely assistants, says 'I'm going to perform a miracle,' and . . . unless you've made a thorough study of how charlatans operate, you'll be suckered." Even as the reverend speaks, Spidey obviously is fooled, and his beliefs are gravely shaken. This despite his being a trained scientist as well as having had personal experience with the real occult (it exists in comics).

This story not only is informative, but it also provides a positive role model who has fallen into a trap (and will, presumably, come to see that he's been suckered). This episode may leave a half-memory that will one day be vital to someone who has to admit that he's been fooled. Often, once a person starts believing, his self-image won't let him admit he has been conned. This comic shows a hero who falls for one of these clowns and then admits he has been gulled.

Actually, comics have been doing some interesting work in the past few years. They have shown that even good people make big mistakes. Speedy (kid sidekick to Green Arrow) was on drugs in the 1970s; Iron Man was an alcoholic, and at one point had lost his fortune and almost killed people with his armor; Spider-Man, it turns out, was a victim of child molestation. This current story, though, is the first I've seen that was relevant to the work of CSICOP.

—Samuel Mize

Samuel Mize lives in Plano, Texas.

Scientologists Donating *Dianetics* Edition to Libraries

ON AUGUST 13, 1950, L. Ron Hubbard's book *Dianetics: The Modern Science of Mental Health* was fourth on the *New York Times* best-seller list. With the help of a massive advertising and media campaign, in 1986 *Dianetics* regained this position. To celebrate the victory, a commemorative edition of *Dianetics* has been issued by Bridge (as in Ron's "bridge to the future") Publications. This edition is being donated to libraries in different parts of the country "to insure that [the] public has access to this popular and helpful book."

If one can ignore the content, this commemorative edition is magnificent. Bound in soft green leather with gold trim, the book resembles a wedding album more than a collection of self-help psychobabble. Quotes from successful Dianetics disciples greet the reader, preparing him or her for the miracles to follow. The book is extremely readable, replete with helpful hints, an extensive glossary, and an index that makes finding any point extremely easy.

The problem is, of course, that one cannot ignore the content. The weaknesses in Hubbard's thought have been extensively commented on elsewhere (e.g., Gardner 1957:263-280; Wallis 1976:9-24), as have the activities of the Scientologists (e.g., Randi 1982:246-250; Corydon and Dewolf 1987), and need not be repeated here. The continuing and growing popularity and influence of Dianetics in spite of the aforementioned works may be of some concern, however. Scientologists feel that they have found the ultimate truth and espouse and defend it with all the ferocity of religious zealots:

> The book *Dianetics* contains L. Ron Hubbard's discoveries about heretofore unknown mental barriers. These actually create evil intentions, fears and other unwanted emotions, and illnesses even in individuals who are trying to live good, happy, productive lives.
>
> Dianetics provides all of the information and instructions on how to recognize and handle these problems. One learns why the barriers exist, the types of problems they cause, the exact procedure to unlock these barriers and relieve an individual from their onerous effects and how to make sure that the relief is lasting. A must for anyone

wanting to help others. [From the form accompanying the donated book.]

Libraries are being given this magnificent edition free of charge as part of a new offensive by the Scientologists. The letter that accompanies the donation, from the "Library Donation Service" of Clearwater, Florida, also reads in part, "Nationwide promotion is slated to continue for the work—increasing awareness and demand for the book and its methods." Awareness is highly debatable. Demand will certainly be increased. The television commercials have already begun airing.

Some sort of response seems in order. While it may not be possible to print and similarly distribute works critical of pseudoscience, such as Martin Gardner's *Fads and Fallacies in the Name of Science* and Terence Hines's recently published *Pseudoscience and the Paranormal,* let us hope some attempt will be made to counter this latest wave of "pop psychology" irrationality.

—*Bobby Newman*

References

Corydon, Bent, and Ronald Dewolf (a.k.a. L. Ron Hubbard, Jr.). 1987. *L. Ron Hubbard: Messiah or Madman.* Secaucus, N.J.: Lyle Stuart.

Gardner, Martin. 1957. *Fads and Fallacies in the Name of Science.* New York: Dover, pp. 263-280.

Hines, Terence. 1988. *Pseudoscience and the Paranormal.* Buffalo, N.Y.: Prometheus Books.

Randi, James. 1982. *Flim-Flam!* Buffalo, N.Y.: Prometheus Books, pp. 246-250.

Wallis, Roy. 1976. Poor man's psychoanalysis?: Observations on Dianetics, *Zetetic (SI).* 1(1):9-24.

Bobby Newman is a student at Queen's College, Flushing, New York, where he is working toward undergraduate degrees in psychology and interdisciplinary science.

Pell Pushes for New Look At Psi Proposals

THE FOLLOWING "What's New" advisory was distributed by Robert L. Park of the American Physical Society, Washington office, on September 23, 1988:

" 'The National Commission on Human Resources Act,' introduced by Senator Claiborne Pell (D-R.I.), is intended to facilitate the attainment of 'full potential in body, mind and spirit,' so that we might 'live in harmony within a transformed family, community, nation and universe.' The commission would have a 'scientific advisory panel to assist the evaluation of technologies and procedures . . . to develop fuller human potential' and would include two people with experience in 'extraordinary human performance research.'

"We are not talking about the Olympics. Pell's aide, Scott Jones, a retired Army officer, spends full-time promoting research into ESP, channeling, etc. Pell himself met with Erich Bloch [director of the National Science Foundation] some time ago to urge changes in the NSF's review of psi proposals. The complaint was that such proposals were being sent to physicists for review rather than to other psi researchers.

"In a related effort, the Parapsychological Association, led by D. I. Radin, has recently attacked a National Academy of Sciences study, *Enhancing Human Performance,* conducted at the request of the Army Research Institute. [See, *SI,* Fall 1988.] Radin complains that the report issued last December would 'influence people who would be interested in funding psi research.' In fact, the Academy report seems to suffer from an excess of caution. After concluding that it could find 'no justification from research conducted over 130 years for the existence [of psi phenomena],' the report goes on to recommend that the Army continue to 'monitor' psi research."

Turning the Table On Pop-Psychic Polls

IN OUR Summer 1988 issue, we called attention to the "How Psychic Are You?" quiz published in *Woman's Day*. It was pointed out that, by using the test's naive scoring system, the lowest score possible was 30 points and that any respondent was virtually guaranteed being rated as having "psychic powers."

SI reader Howard J. Stein, of Grand Rapids, Michigan, satirizes another deficiency of the test—the format of its questions. All were of this variety: "Have you ever dreamed about an unfamiliar place or face and seen that place or face within a few days? Yes. No."

Stein shows the bias of such wordings simply by turning them around. In a test he calls "How rational are you?" he flip-flops them:

"Do most of your dreams not come true, even approximately?"

"Have you ever felt that something was going to happen, only to find out that it did not?"

"While away from someone you love, have you ever sensed that your loved one was in danger and found out later that you were wrong?"

And so on.

It is a good lesson to point out to those who find such "tests" persuasive evidence of their own psychic powers. But what about his own bias? "In the event that readers feel I put my own twist in the revisions," says Stein, "assure them that the devil made me do it."

—*K.F.*

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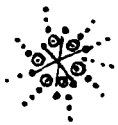

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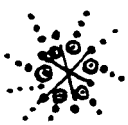

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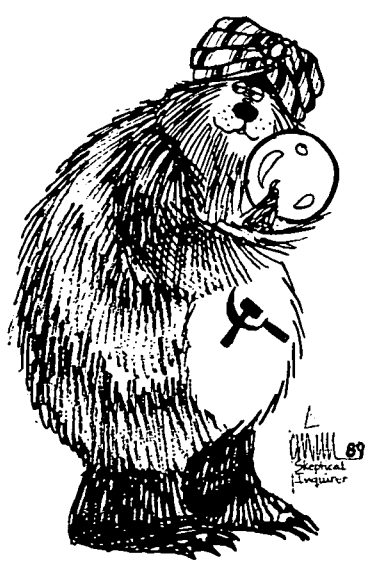
ROBERT SHEAFFER

Psychic Vibrations

LEST THE REST of the world conclude that we Americans have a monopoly (or at least a corner) on belief in silly things, it should be noted that the *New York Times* recently carried an article titled "The Russians, Too, Embrace 'Secret Silliness' of Astrology." The article described the antics of Dzhuna Davitashvili, a celebrated "psychic healer" who reportedly cures diseases with a "healing touch" she modestly calls "Effect D," after herself. A few weeks later the *New York Post* reported that, in Moscow, a Soviet filmmaker issued a call for a summit meeting of "Soviet and American astrologers." Elem Klimov, first secretary of the USSR's cinematographers union, raised the issue by suggesting that "maybe the U.S. astrologers have something to say in contradiction to what ours are saying." Since, according to Klimov, local Moscow astrologers are proclaiming that "the twentieth-century is going to be the century of Russia," one might be justified in suspecting that American astrologers would reach a different conclusion from the same charts—although it is hard to imagine what scientific principles the two groups of astrologers might agree on to settle the question.

* * * * *

Unfortunately, Nancy Reagan's now-famous infatuation with astrology seems to have had consequences other than just randomly scrambling the times for the president to sign treaties and make speeches. According to syndicated columnists Jack Anderson and Dale Van Atta, the Soviet consulate in San Francisco is believed to have tapped into the unsecured phones lines that the First Lady routinely used to discuss matters of national policy with her astrologer. Sources in the White House, the National Security Council, and the CIA now believe that the Soviets monitored and recorded hundreds of phone calls between Mrs. Reagan in Washington and her astrologer, Joan Quigley, in San Francisco, a task made easier because these astral consultations took place fairly regularly on Saturday afternoons. One alarmed White House official was quoted



as saying that he assumes Mrs. Reagan was asking her astrologer questions along the lines of: "Ronnie's thinking about changing this policy or that policy. Are the signs right?" These discussions of geopolitical astrology apparently made it possible for the Soviets to draw up some charts of their own.

* * * * *

The latest and greatest series of spectacular UFO photos to excite (and divide) the world of UFOlogy were taken by a man in Gulf Breeze, Florida, who is known only by the peculiar pseudonym "Mr. Ed." In November 1987, he walked into the offices of the *Gulf Breeze Sentinel,* a weekly paper, with five Polaroid photos of a supposed UFO and a letter from the supposedly anonymous photographer—who was later revealed to be none other than Mr. Ed himself. The photos show UFOs that are little more than small splotches of light, looking much like the reflections of interior lights on windowpanes.

Investigators from the Mutual UFO Network (MUFON), the largest American UFO group still functioning, went to his home soon afterward, where the photos are supposed to have been taken. (The Aerial Phenomena Research Organization, by the way, passed from the scene in the spring of 1988. Once large and feisty, APRO folded with the death of its founder, Coral Lorenzen.) As Mr. Ed was interviewed, the story of his UFO sighting grew increasingly bizarre. He claimed to have been "frozen" in a blue beam from the UFO while he was taking his pictures. He was unable to move his eyes and barely able to breathe. Then he allegedly felt himself lifted off the road. He claims he heard an "authoritative voice" talking to him telepathically. Then it seemed that someone was showing him a book of dog pictures, with "words or something" at the bottom of each picture identifying each dog. On a later occasion, he allegedly heard a "humming" sound in his head and a computerlike voice speaking to him. Still later, he says, he heard alien voices speaking in Spanish, snapped another UFO photo, and then found himself "eyeball to eyeball" with a humanoid creature about four feet tall. Many other strange events were subsequently reported. Mr. Ed is in truth a neophyte storyteller, not at all in the class of Whitley Strieber, so his yarns tend to get tediously repetitive. If you're interested in imaginative fiction you'll find Strieber's *Communion* far more exciting. Nonetheless, MUFON's preliminary investigation found Mr. Ed's evidence to be "overwhelming."

However, two investigators from the J. Allen Hynek Center for UFO Studies. Mark Rodeghier and Robert D. Boyd, came to a different conclusion. Having talked to people who have known Mr. Ed for some time, they note not only that he is known as "a practical joker and prankster" but that he told a number of people he was planning to pull off the "ultimate prank." They further observe that Mr. Ed's story has several "curious parallels" with Strieber's *Communion,*

which was published only a few months before UFOs first visited Gulf Breeze, and that Mr. Ed's photos look so unconvincing that even the *National Enquirer* declined to publish them!

Nonetheless, MUFON continues in a state of high excitement about the case, even arranging for *Intruders* author Budd Hopkins to fly to Florida to hypnotize Mr. Ed to confirm his suspicion that an alien probe was implanted in his forehead. MUFON has even agreed to pay for a CATscan for Mr. Ed to confirm the presence of this alien technology. MUFON's director, Walt Andrus, writes gleefully: "This could develop into one of the most significant cases in UFO history. Even the skeptics may be overwhelmed with incontrovertible evidence."

* * * * *

As if there were not enough monsters, UFOs, psychic miracles, and holy figures on tortillas for all the sharp-eyed observers of the world to hone their powers of discernment, it now appears that a number of solid citizens have reported seeing none other than Elvis Presley himself, whom the unimaginative believe to have died years ago. If eyewitness accounts are to be believed, Elvis is alive and well and living in Kalamazoo, or perhaps Texas, or Hawaii, depending on which witnesses you believe. A new book titled *Is Elvis Alive?* suggests that Presley faked his death and staged a mock funeral so that he could slip off somewhere, lose a great deal of weight, and conquer his drug addictions—while leaving behind his Graceland estate, his wife and daughter, and zillions of dollars' worth of stuff. While busily pretending to be dead, Elvis nonetheless still calls up his fan clubs from time to time and is occasionally spotted in supermarkets and hamburger joints. Surely, with the testimony of so many eyewitnesses and earwitnesses, there must be *something* to it! •

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Special Report

Water With Memory? The Dilution Affair

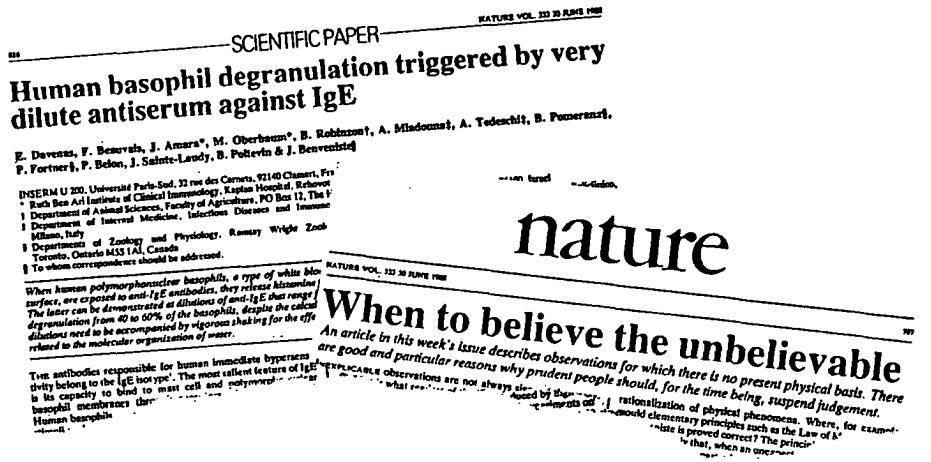
Martin Gardner

"EXPERIMENTER EFFECT" has two meanings. Outside psychic research circles it refers to the way a strongly held mind-set can unconsciously bias an experimenter's work. Among parapsychologists it also refers to the supposed unconscious influence of an experimenter's PK (psychokinetic) powers on the research.

Putting aside the second meaning (if such an effect is real it would throw doubt on all empirical findings since Galileo), a bizarre instance of the experimenter effect came to light last July. It involves a group of scientists at INSERM U200, a medical-research institute in a Paris suburb. Their findings were widely publicized (*Newsweek,* July 25; *Time,* August 8), not merely because they were so astounding but because for the first time they seemed to provide strong empirical support for the fringe medicine of homeopathy.

The century's most notorious instance of an experimenter effect that sparked a vigorous scientific controversy also occurred in France. In 1903 René Prosper Blondlot, a respected French physicist, claimed to have discovered a new kind of radiation, which he called N-rays after the University of Nancy, where he worked. Scores of papers confirming the reality of N-rays had appeared in French journals before a skeptical American physicist, Robert Wood, visited Blondlot's laboratory and played a dirty trick on him. Wood secretly removed from Blondlot's apparatus a prism that was claimed to be essential to the observation of N-ray spectra. Blondlot went right on describing the lines he fancied he was seeing. After Wood reported this in the British science journal *Nature* (vol. 70, 1904, p. 530), N-rays vanished from physics, but poor old Blondlot never acknowledged his self-deception.

Last June, physicists and chemists around the world were incredulous over a paper in *Nature* (vol. 333, June 30, p. 816) titled "Human basophil degranulation triggered by very dilute antiserum against IgE." The report was



SCIENTIFIC PAPER

Human basophil degranulation triggered by very dilute antiserum against IgE

E. Davenas, F. Beauvais, J. Amara*, M. Oberbaum*, B. Robinzon†, A. Miadonna‡, A. Tedeschi‡, B. Pomeranz‖, P. Fortner§, P. Belon, J. Sainte-Laudy, B. Poitevin & J. Benveniste

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* Ruth Bess Art Institute of Clinical Immunology, Kaplan Hospital, Rehovot
† Department of Animal Sciences, Faculty of Agriculture, PO Box 12, The
‡ Department of Internal Medicine, Infectious Diseases and Immune
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‖ Department of Zoology and Physiology, Ramsay Wright Zoo
Toronto, Ontario M5S 1A1, Canada
§ To whom correspondence should be addressed.

When human polymorphonuclear basophils, a type of white blo
surface, are exposed to anti-IgE antibodies, they release histamine
The latter can be demonstrated at dilutions of anti-IgE that range
degranulation from 40 to 60% of the basophils, despite the calcul
dilutions need to be accompanied by vigorous shaking for the effe
related to the molecular organization of water.

The antibodies responsible for human immediate hypersens
tivity belong to the IgE isotype1. The most salient feature of IgE
is its capacity to bind to mast cell and polymorph
basophil membranes thr
Human basophils

nature

When to believe the unbelievable

An article in this week's issue describes observations for which there is no present physical basis. There are good and particular reasons why prudent people should, for the time being, suspend judgement.

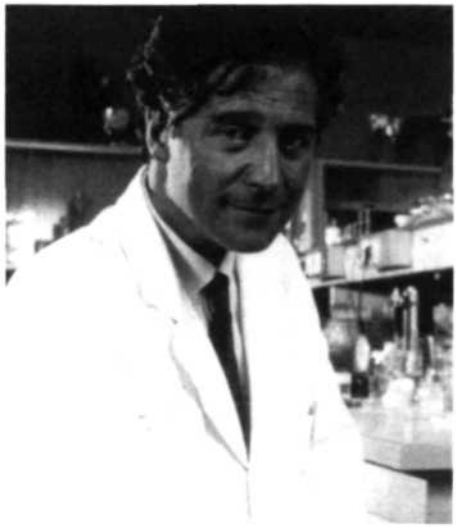
EXPLICABLE observations are not always ex
rationalization of physical phenomena. Where, for exam
should elementary principles such as the Law of
nciple is proved correct? The princi
e that, when an

The French group's original report and *Nature*'s editorial calling it unbelievable.

signed by 13 biologists—two from Israel, one from Italy, one from Toronto, and the others part of a team at INSERM headed by biochemist Jacques Benveniste. The phrase "very dilute" in the title is a whopping understatement. As the editors of *Nature* pointed out in an unusual disclaimer accompanying the article, the dilution of the French group was so extreme that not a molecule of the antiserum was left in its solvent. The editors considered the results unbelievable, but said they were publishing the paper for two reasons: It purported to give an accurate account of work that had been widely trumpeted in France by popular articles, and it provided other scientists with an opportunity to confirm or falsify the extraordinary claims.

What were these claims? In essence the French researchers were convinced that, after all the molecules of a certain antibody were removed from distilled water, the water somehow "remembered" the antibody's chemical properties. Although such a claim violates fundamental laws of physics, it lies at the very heart of homeopathy, a medical pseudoscience that flourished in the United States in the nineteenth century and is now enjoying a modest revival. Homeopaths maintain that, if a drug produces symptoms of a disease in a healthy person, inconceivably small quantities of that same drug will cure the disease. Moreover the smaller the amount of the drug—including its total absence—the more potent its curative power.

Thousands of homeopathic drugs are listed in the cult's *materia medicas*—handbooks that vary widely from time to time and from country to country. If a drug is soluble—bee venom, for example—it is mixed with water or alcohol in repeated dilutions. The mixture must be shaken violently for about ten seconds after each dilution, otherwise the medicine won't work. If a drug is not soluble, it is ground into a fine powder and diluted by repeated mixing with powdered lactose (milk sugar). A moderate homeopathic dose, called "30*c*," is arrived at by first diluting the drug to a hundredth part and then repeating the process 30 times. As someone pointed out, it is like taking a grain of a substance and dissolving it in billions of spheres of water, each with the diameter of the solar system.



Sygma

Jacques Benveniste

Benveniste claims that the antibody he used is still potent when dilutions are even more extreme—one part to 10^{120} parts of water! As science writer Malcolm Browne remarked in his *New York Times* account of the French claims (June 30), astronomers estimate the number of stars in the universe as a mere 10^{20}. Benveniste said the potency of his dilutions is comparable to swirling your car key in the Seine, going some hundred miles downstream, taking a few drops of water out of the river, and then using them to start your car. It is easy to show mathematically that when such extreme dilutions are made of homeopathic drugs, as they are constantly, the chance of a single molecule remaining in the solvent or powder is vanishingly small.

Certain white blood cells, called "basophils," have granules that stain a reddish color when treated with a blue dye. Incubating these cells with a strong solution of an antibody causes them to lose those granules, a process known as "degranulation." When a solution of the antibody has been diluted to the point at which no molecules of the antibody remain in the distilled water, one would expect the cells to retain their red-staining granules. Not so. According to Benveniste, about half the basophils continued to degranulate when so treated.

How do homeopaths explain this supposed potency of infinitesimal doses, even when the dilution removes all molecules of a drug? They invoke mysterious vibrations, resonances, force fields, or radiations totally unknown to science. Benveniste suggests in his paper that antiserum molecules may somehow cause water molecules to rearrange their hydrogen atoms in some inexplicable fashion that mimics the action of the antibody even when it is no longer there. In other words, water can remember the properties of a missing substance.

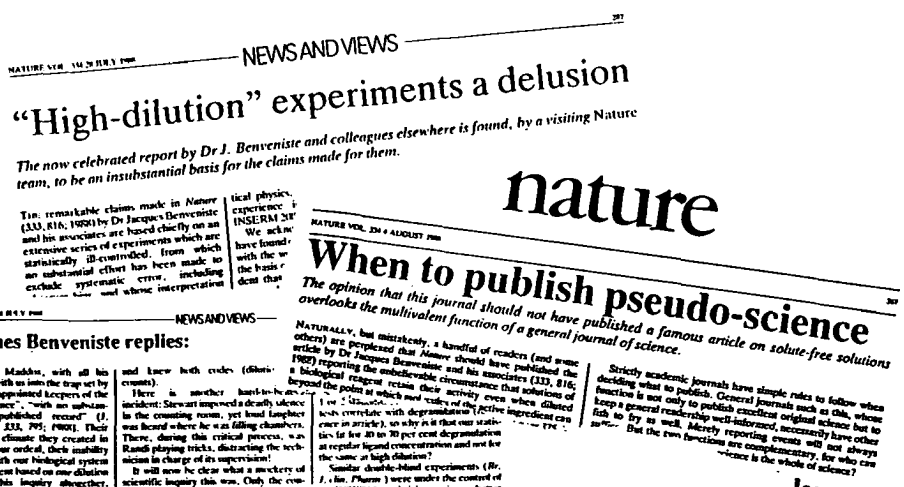
This magic memory water is even weirder than polywater, a conjectured new type of water that caused an enormous flap among chemists in the 1960s. Boris Derjaguin, a Soviet chemist, announced that when water collects in hairlike capillary tubes it acquires all sorts of strange properties. John D. Bernal, a noted British physicist and historian of science (he was also a dedicated communist and a great admirer of Soviet science), hailed it as the "most important physical-chemical discovery of this century."

Because polywater, as it was called, could have great military uses, the

Army, Navy, and other U.S. agencies began tossing out generous grants. A flood of papers about polywater popped up everywhere. Derjaguin even wrote a nontechnical article about the water for *Scientific American* (November 1970). *Nature* (224, 1969, p. 198) published a warning from an American scientist that research on polywater should proceed with extreme caution because it might polymerize the earth's oceans, destroy all life, and change the earth into a planet like Venus.

It turned out that the miraculous water was just ordinary water contaminated by dirty test tubes. Derjaguin himself threw in the towel by announcing that for ten years he had wasted his time studying nothing more than dirty water. Meanwhile millions of dollars had been squandered on polywater research. You can read all about this remarkable farce in *Polywater* (MIT Press, 1981), a fine book by Felix Franks. He faults government agencies for premature funding, technical journals for overpermissiveness, experimenters for repeated self-deception, and the mass media for irresponsible hype.

It is too early to know if Benveniste's homeopathic water will survive as long as polywater did, or if the French biochemist will eventually withdraw his paper. *Nature,* highly suspicious of so outrageous a claim, asked a team of unpaid volunteers to fly to Paris to devise and observe a replication of Benveniste's experiments in his own laboratory. (The visit and investigation were preconditions for publication of the original article.) Benveniste readily agreed, and even planned a celebration with champagne when the replication was over and his results were vindicated. The team consisted of John Maddox, editor of *Nature,* who has a background in physics; Walter Stewart, an organic chemist and a specialist in scientific fraud from the National Institutes of Health in Bethesda, Maryland; and the indomitable magician and psi detective, James Randi.



NEWS AND VIEWS

"High-dilution" experiments a delusion

The now celebrated report by Dr J. Benveniste and colleagues elsewhere is found, by a visiting Nature *team, to be an insubstantial basis for the claims made for them.*

nature

When to publish pseudo-science

The opinion that this journal should not have published a famous article on solute-free solutions overlooks the multivalent function of a general journal of science.

NEWS AND VIEWS

Dr Jacques Benveniste replies:

Nature's subsequent investigative team called the results a delusion. Benveniste replied angrily, and a subsequent editorial defended *Nature*'s actions.

Their blistering report in *Nature* (334, July 28) opens: "The remarkable claims made . . . by Dr. Jacques Benveniste and his associates are based chiefly on an extensive series of experiments which are statistically ill-controlled, from which no substantial effort has been made to exclude systematic error, including observer bias, and whose interpretation has been clouded by the exclusion of measurements in conflict with the [claims]. . . . The phenomenon described is not reproducible in the ordinary meaning of that word. We conclude that there is no substantial basis for the claim. . . . The hypothesis that water can be imprinted with the memory of past solutes is as unnecessary as it is fanciful."

The popular French magazine *Science et Vie* (Science and Life) in its August issue was disturbed by the fact that Benveniste had announced as early as May, at a national conference on homeopathy, that his paper would be appearing in *Nature*. On July 1, journalists in France received a thick press release about the forthcoming paper, and in July the French stock exchange did a brisk business in Boiron shares. *Science et Vie* wondered if French newspapers and television stations would give as much publicity to the debunking of Benveniste's work as they did to its promotion. If not, "water memory will remain an established fact for believers in homeopathy."

The key person in all the French experiments, as well as in their "confirmation" by a laboratory in Israel, was Dr. Elizabeth Davenas, a young woman in her twenties and a good friend of Bernard Poitevin, one of the two homeopathic doctors in the French group. She is the observer who looks through the microscope to count the red-staining granules that remain. Randi listed 15 different pretexts on which she accepted "good" cases and rejected "bad" ones; Stewart's list contained 19 such items. It is not clear whether she

Photo by James Randi

Elizabeth Davenas, lead experimenter of the French group, in her lab.

Photo by James Randi

Walter Stewart and John Maddox during a break from their observations.

is deceiving herself in a manner similar to Percival Lowell's famous self-deception when he peered through telescopes and drew pictures of intricate canals on Mars, or whether some cells actually lose color occasionally because of contaminants. On this point the *Nature* investigators write:

> In circumstances in which the avoidance of contamination would seem crucial, no thought seemed to have been given to the possibility of contamination by misplaced test-tube stoppers, the contamination of untended wells during the pipetting process and general laboratory contamination (the experiments we witnessed were carried out at an open bench). We have no idea what would be the effect on basophil degranulation of the organic solvents and adhesives backing the scotch tape used to seal the polystyrene wells overnight, but neither does the laboratory.

The original *Nature* report was understandably greeted with loud hosannas by homeopaths around the world. Readers interested in the wild history of this once most popular of all alternative medicines can consult Chapter 16 of my *Fads and Fallacies* (Dover, 1952), or "Homeopathy: Is It Medicine?" by Stephen Barrett in the SKEPTICAL INQUIRER (12, Fall 1987; see also comments in the letters section of the 1988 Spring and Summer issues). Dr. Barrett is also the author of a hard-hitting paper in *Consumer Reports* (January 1987) about a yearlong investigation of homeopathy. His report concludes:

> Unless the laws of chemistry have gone awry, most homeopathic remedies are too diluted to have any physiological effect. . . . CU's [Consumers Union] medical consultants believe that any system of medicine embracing the use of such remedies involves a potential danger to patients whether the prescribers are M.D.'s, other licensed practitioners, or outright quacks. Ineffective drugs are dangerous drugs when used to treat serious or life-threatening disease. Moreover, even though homeopathic drugs are essentially nontoxic, self-medication can still be hazardous. Using them for a serious illness or undiagnosed pain instead of obtaining proper medical attention could prove harmful or even fatal.

I find in my files a sad clipping from the *New York Post* (July 25, 1954) about Jerold Winston, a Long Island boy, age 4, who died of leukemia. For 16 months he had been treated only with a homeopathic remedy by his mother, the daughter of a homeopathic doctor. The parents were facing a possible manslaughter charge for child neglect. Who knows how many tragedies like this occur when gullible people rely solely on worthless medicines?

Homeopathy had almost died in the United States by 1960, though it continued to be popular in France, Germany, Russia, India, England, Mexico, Argentina, Brazil, and other countries. But in the New Age climate of the seventies and eighties it experienced a surprising upsurge among those who are attracted to holistic medicine, natural foods, herbal remedies, acupuncture, reincarnation, and the paranormal. There are now several hundred homeopathic doctors in the United States, about half with orthodox medical degrees. The others are mostly chiropractors, naturopaths, dentists, veterinarians, and nurses. This is a small number compared to some 14,000 such physicians in 1900, when more than 20 schools in the United States taught the art and there were more than 100 homeopathic hospitals.

New books on homeopathy are appearing on general trade lists. Jeremy Tarcher, a publisher of New Age literature (including books on Spiritualism) has two homeopathic volumes in his current catalog: *Everybody's Guide to Homeopathic Medicines,* by Stephen Cummings and Dana Ullman, and *Homeopathic Medicine at Home,* by Dr. Maesimund Panos and Jane Heimlich. Heimlich is the wife of Dr. Henry Heimlich, orginator of the famous "Heimlich maneuver," used to aid persons choking on food. In 1980 she was quoted in the *New York Times* (November 19) as saying she took great pride in converting her father, the dancing teacher Arthur Murray, to homeopathy.

The Complete Book of Homeopathy, by Michael Weiner and Kathleen Goss, was issued by Bantam Books in 1981. With all the media publicity about Benveniste, and the continuing growth of New Age nonsense, more such books are surely on the way. Nothing stimulates a fringe medical cult more than attacks by skeptics, or by "allopaths," the homeopathic term for orthodox doctors.

Cummings and Ullman, in their book on homeopathy, claim there are more than 6,000 homeopathic doctors in France today, and 18,000 pharmacies that sell their medicines. In India, they tell us, more than 70,000 doctors practice the art. (In an article in the January 1984 issue of *Fate* magazine, the

nation's sleaziest occult periodical, Ullman upped this number to 200,000.) England's royal family, according to the Queen's physician, has been under homeopathic care for more than 150 years. Dozens of famous nineteenth-century American writers, political leaders, and businessmen patronized homeopathic physicians, including Washington Irving, who died under the care of a homeopathic family doctor. Ullman, who holds a master's degree in public health from the University of California, Berkeley, is the nation's top homeopathic journalist. He was arrested in California in 1976 for practicing medicine without a license.

How will homeopathic doctors and true believers react to *Nature*'s debunking? There is not the slightest doubt they will take their cues from Benveniste's angry reply, which ran in the same issue of *Nature* as the critique. His invective is unprecedented in a science journal. Members of the *Nature* team are branded "amateurs" who created "hysteria" in the French laboratory. Their investigation is called a "mockery of scientific inquiry." Benveniste likens it to the Salem witch-hunts and the McCarthy persecutions. He told the *Wall Street Journal* by phone (July 17) that the *Nature* report was a sinister plot to discredit him. In Paris he told *Le Monde* (July 27) that Walter

In this cartoon, which appeared in *Science et Vie*, Jacques Benveniste is saying, "A frog passed through this water in 1789." The frog wears a stocking cap associated with the time of the French Revolution.

Stewart was incompetent and the investigation was a "scientific comedy . . . conducted by a magician and a scientific district attorney who worked in the purest . . . Soviet ideology style" to install a "scientific gulag."

"During the whole week I was tempted to kick them out," he said to the French newspaper *Le Figaro* (July 27). "We never could imagine the extent to which these 'experts' were going to shuffle the cards." He attacked *Science et Vie* for calling him a "new Lysenko," adding "you should know that I am the most important researcher in the world and the one most in demand at colloquia."

It is obvious from Benveniste's fury that he learned absolutely nothing from *Nature*'s investigation. Its lessons had the same effect on his mind as a vanishing substance has on distilled water.

Consider the egotism and folly of this man. He rushes into print with a claim so staggering that if true it would revolutionize physics and medicine, and guarantee him a Nobel prize. Yet he did this without troubling to learn the most elementary techniques for conducting truly double-blind tests or for supervising self-deceiving observers. When Randi mentioned N-rays to him, he said he had never heard of them! Does he remember, one wonders, the story of polywater?

A few scientists and science journalists criticized *Nature* for publishing the original article. Daniel Koshland, Jr., editor of *Science,* agreed that a responsible journal should "encourage heresy" but added that it also should "discourage fantasy." It is one thing, he told science writer Walter Sullivan (*New York Times,* July 17), to publish unorthodox work that may turn out to be wrong, but the French claim about water with a memory was too far on the fantasy side, like an account of the successful construction of a perpetual-motion machine.

Other scientists have faulted *Nature* both for publishing the French paper in the first place and for later investigating the claims. Arnold Relman, editor of the *New England Journal of Medicine,* said *Nature* should have required confirmation by an independent group of biochemists before running the article, and that it was not its function to serve as an investigative body. This view was shared by Henry Metzger, a colleague of Stewart at the NIH. He said he had urged this approach when he refereed the paper for *Nature.* Immunologist Avrion Mitchinson, at University College London, thought the French paper not worth publishing. However, he did not believe it would do much harm. He said, "Anyone who thinks the great ship of science can be damaged in such a way is greatly mistaken." (On such criticisms see "More Squabbling Over Unbelievable Result," in *Science,* 241, August 5, and "The Ghostbusters Report from Paris," in *New Scientist,* August 4.)

Nature's correspondence section (August 4) ran four letters from scientists who proposed conventional explanations for the French results. In the same issue the editors defend themselves in an editorial headed "When to Publish Pseudo-science." When one-fourth of French doctors prescribe homeopathic medicines, they argue, "there is plainly too much at stake for the issue to be dropped."

The editorial recalls an earlier publication in *Nature* (238, 1972, pp. 198-210) of the claim that, when the protein scotophobin is extracted from the brains of rats trained to run a maze and then injected into untrained rats, there is a transfer of maze-running ability. The paper was followed by a "devastating critique" by Stewart, and that ended the matter. "Is not a little of the 'circus atmosphere' inescapable on these occasions?" Why did *Nature* not withhold the French report until they made their investigation, then publish the two reports side by side? The editors have replied elsewhere that they did not do this because Benveniste had leaked information about his paper to the French press and, had they withheld his paper until after their investigation, he would have refused to allow *Nature* to print it.

INSERM (the letters stand for Institut National de la Santé et de la Recherche Médicale) has refused to take sides in the controversy. Next spring, it has announced, Benveniste's work will be subjected to its regular examination and a judgment made then. Benveniste has taken this to mean that INSERM is tossing him to the wolves. "*Nature* sends a magician to check my research," he declared, "and INSERM doesn't even protest. It's the limit!" I quote from Peter Coles's article, "Benveniste Controversy Rages in the French Press" (*Nature,* August 4). He also reveals that Boiron, a 51-percent shareholder in another firm, Laboratoires Homéopathiques de France, has purchased all remaining shares.

"Look," Randi said to the French group, "if I told you I keep a goat in the backyard of my house in Florida, and you happen to have a man nearby, you might ask him to look over my garden fence. He would report, 'That man keeps a goat.' But what would you do if I said, 'I keep a unicorn in my garden'?"

The point of course is that no extraordinary verification is needed to establish the existence of a goat in Randi's garden. But a unicorn? As the *Nature* authors write sadly at the close of their indictment, "We have no way of knowing whether the point was taken." •

Martin Gardner's "Notes of a Fringe-Watcher" column will return in its usual format next issue. His latest book, The New Age: Notes of a Fringe-Watcher *(Prometheus Books), consists in part of past columns and updates.*

Skepticism Isn't an 'Ism'

Despite its suffix, skepticism is not an "ism" in the sense of a belief or dogma. It is simply an approach to the problem of telling what is counterfeit from what is genuine. And a recognition of how costly it may be to fail to do so. To be a skeptic is to cultivate "street smarts" in the battle for control of one's own mind, one's own money, one's own allegiances. To be a skeptic, in short, is to refuse to be a victim.

—Robert S. DeBear, "An Agenda for Reason, Realism, and Responsibility," *New York Skeptic* (newsletter of the New York Area Skeptics, Inc.), Spring 1988

The Case of the Remembering Water

James Randi

AFTER PARTICIPATING in the *Nature* team's investigation of homeopathic claims asserted by the French laboratory INSERM U200 in Clamart, France, I was led once more to the conclusion that self-deception and data flummery are not as rare in orthodox science as I had once suspected. Some 20 years ago, before I had looked into fields other than parapsychology, I was aware that a certain amount of impropriety took place in what is recognized as "regular" science. Those improprieties, I believed, were well publicized when they were discovered. Only with more experience did I learn that misconduct and even fraud are very often discovered but not reported by the academic world.

Walter W. Stewart, who works for the National Institutes of Health in Bethesda, Maryland, spends much of his time looking into such matters. I met him in person for the first time during what has become known as the "Water with a Memory" episode. Stewart and I were asked to join John Maddox, editor of *Nature,* to look into this most unusual claim. During the investigation, I recognized many of the earmarks of the experiments I had previously examined in the twilight zone of parapsychology.

Many parapsychologists I have met are dedicated scientists, but often somewhat naive. They have, at best, peripherally significant data with which to support their beliefs. This kind of data was well described by John Beloff, once president of the Parapsychological Association, as "fragile." It does not stand up well under examination; nor are the experiments easily replicated. This is quite unlike "orthodox" scientific data, which are required to be robust in a variety of ways.

Jacques Benveniste, director of INSERM U200, met us in his lab and prepared us for an introduction to Elizabeth Davenas, his chief experimenter. Now I have often said that there seems to be an automatic alarm system built into the back of my skull that sounds whenever I begin to receive suspicious information. That alarm began functioning. Said Benveniste: "Wait till you meet this woman. She is a person from another planet." I heard a faint tinkling. My colleagues squirmed a bit. "And," he continued, "she is a good church-going Christian." A distinct tinkling was heard this time. Benveniste went on: "Elizabeth is the only person in my lab who gets consistently good results with this test." The ringing was getting louder. "Her results are all recorded in notebooks with consecutively numbered pages." It sounded as if Big Ben were a block away, rather than across the English Channel.

That last comment was very significant. To me, it seemed to be offered as an assurance that the lab records had not been altered. Why would Benveniste specify such a fact? I suspected that perhaps—just perhaps—he was giving us a guarantee that his personnel would not and could not falsify data. That suspicion was reinforced when, later, he announced to us with his arms folded across his chest that he would not under any circumstances entertain the notion that his employees might be capable of "adjusting" any data, a possibility that we had not at that point even suggested to him. He told us that he did not want to hear the idea brought up. We were well warned.

Our investigation revealed, first, that the mass of data generated from the Clamart lab could not have been obtained by the means described in the group's original *Nature* paper. That takes some explanation, which I now offer in a much simplified version. Any data obtained by counting or measuring samples (people, cells, weights, stars, etc.) is subject to the rule that it must conform to a "bell-shaped curve." This means that for any data-gathering system we can draw a curve on graph paper and plot each data-point against that curve. If we generate enough data, we will find that the data curve and the bell-shaped (Gaussian) curve agree closely. Any sufficiently large amount of data will follow this rule if the data have been properly obtained and recorded, since there *must* be errors in sampling or counting and there have to be extremes that are simply wrong but, because they are allowed for, do not affect the conclusions or the validity of the experiment. Stewart generated an appropriate Gaussian curve on his computer and fed the data obtained from Benveniste's lab books into it. The game was afoot: What we had before us was evidence that a great proportion of the lab data had been obtained by unorthodox methods. That is as kindly as I can put it. (See Figure 1.)

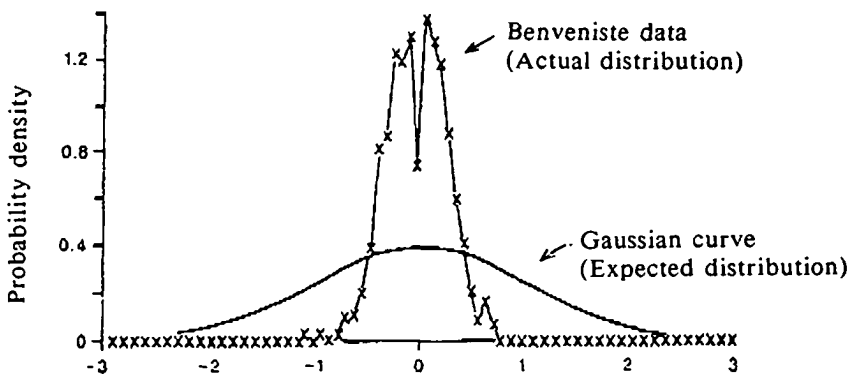


FIGURE 1

We discovered that Benveniste had not done his experiments "blind," as he had described in his *Nature* paper. A blinded experiment (generally described) is one in which the experimenter does not know where the results should show up, for example, because there has been a randomization of samples. A nonblinded experiment is prone to being distorted—unconsciously or consciously—by anyone involved in it. Furthermore, we discovered that Benveniste's lab had omitted much negative data from their lab records because some mitigating circumstance had suddenly become apparent after it was discovered that a particular experiment gave negative results. For example, we were told that sometimes blood used in tests was, for a variety of reasons, found to be "unsuitable." Allergies, drug use, and fatigue on the part of the donor were a few of the reasons for throwing out the results of an experiment *and failing to record them.*

Knowing what we did then, we concluded that the *Nature* paper had not described carefully several aspects of the research and was unacceptable. Though the three extensive experiments that we supervised at the INSERM U200 laboratory—except for being properly blinded—were done in exactly the same way Benveniste claimed to have done his experiments over the previous five years, the results were negative, a fact that Benveniste could not explain. But there was a move we then had to make.

Stewart generated a second Gaussian curve on his computer and entered the new data obtained from our three experiments. Though this was a very small data base and the "fit" was therefore rough, the results were quite conclusive. (See Figure 2.) These data conform exactly as predicted by theory, while the much more extensive previous data in Figure 1 jump out at the observer as glaring evidence of something being very wrong.

My personal opinion is that Benveniste believes in his findings. Yet we showed sound reasons, some of which I have described here, for tne Ben-

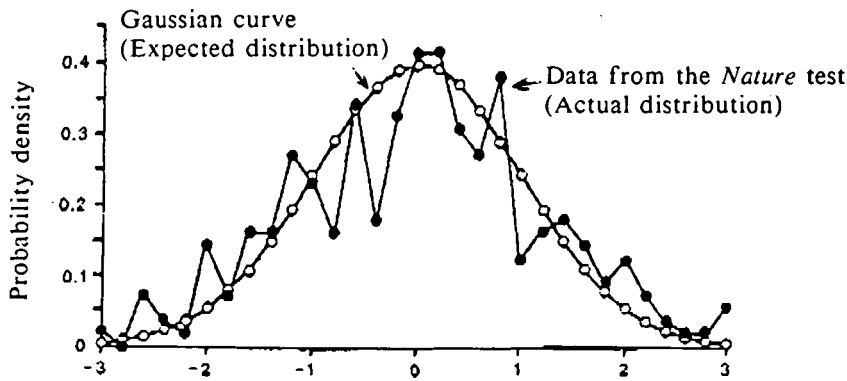


FIGURE 2

veniste claims to be rejected as evidence that water has a memory.

The casual reader may be unfamiliar with the astounding flexibility of the minds of those involved in these remarkable claims. This elasticity was demonstrated during the most recent confrontation that Stewart and I had with Benveniste, on a London late-night television program. He actually announced that, after close examination of the results of the experiments we had supervised at his Clamart laboratory, he had found that, rather than damning his work, they had validated his theories!

Once again, it boggles the mind. . . . •

James Randi was a member of the Nature *investigating team. He is a renowned conjuror and investigator and is a MacArthur Foundation Fellow.*

Guide to the 'Dilution' Controversy

Here is a guide to the key reports on the remarkable case of Jacques Benveniste's claims and Nature*'s subsequent investigation into the "dilution" controversy. They are arranged chronologically.*—ED.

Primary Sources

Davenas, E., et al. [including J. Benveniste]. "Human Basophil Degranulation Triggered by Very Dilute Antiserum Against IgE." *Nature,* 333:816-818, June 30, 1988. A one-paragraph "Editorial Reservation" by *Nature* appeared at the end of this paper.

"When to Believe the Unbelievable" (Editorial). *Nature,* 333:787, June 30, 1988.

Maddox, John, James Randi, and Walter W. Stewart. " 'High-Dilution' Experiments a Delusion." *Nature,* 334:287-290, July 28, 1988.

Benveniste, Jacques. "Dr. Jacques Benveniste Replies." *Nature,* 334:291, July 28, 1988.

"When to Publish Pseudo-science" (Editorial). *Nature,* 334:367, August 4, 1988.

Benveniste, Jacques. "Benveniste on *Nature* Investigation" (Letter). *Science,* 241:1028, August 26, 1988.

Maddox, John. "Maddox on the 'Benveniste Affair' " (Letter). *Science,* 241:1585-1586, September 23, 1988.

Notable Reports on the Controversy

Hudson, Richard L. "Nature Debunks Piece It Just Published That Supported Homeopath's Claims." *Wall Street Journal,* July 27, 1988, p. 30.

Sullivan, Walter. "Report in Scientific Journal Is Held to Be Flawed." *New York Times,* July 27, 1988.

Dagani, Ron. "*Nature* Publishes Paper It Finds Unbelievable." *Chemical & Engineering News,* July 4, 1988, p. 5.

"Nature Sends in Ghostbusters to Solve Riddle of the Antibodies." *New Scientist,* July 21, 1988, p. 26.

Rensberger, Boyce. "Research Called 'Shoddy' by Publisher of Article." *Washington Post,* July 27, 1988, p. A16.
"Only the Smile Is Left." (Letters commenting on Davenas's original paper.) *Nature,* 334:375-376, August 4, 1988.
Vines, Gail. "The Ghostbusters Report From Paris." *New Scientist,* August 4, 1988, pp. 30-31.
Coles, Peter. "Benveniste Controversy Rages on in the French Press." *Nature,* 334:372, August 4, 1988.
Pool, Robert. "More Squabbling Over Unbelievable Result." *Science,* 241:658, August 5, 1988.
Langone, John. "The Water That Lost Its Memory." *Time,* August 8, 1988, p. 73.
Wade, Nicholas. "Looking Hard at Science's Self-Scrutiny." *New York Times,* August 21, 1988.
Dixon, Bernard. "Criticism Builds Over *Nature* Investigation" and "A Brief History of Dubious Science." *The Scientist,* 2(16):1, 4-5, September 5, 1988.
Garfield, Eugene. "Contrary to *Nature*?" (Editorial). *The Scientist,* 2(16):12, September 5, 1988.
"Unreproducible Results." *Nature* (Letters). 235:109, September 8, 1988. Five more letters. •

We will follow further developments in this remarkable episode with great interest. The case of the "Remembering Water" is not yet concluded. New information and perspectives are likely to emerge. The affair also raises important issues about the proper way to evaluate and treat highly controversial claims. Our pages will be open to future reports and discussions.—THE EDITOR.

Plan Ahead for the 1989 European CSICOP Conference

CSICOP's second European conference will be held at the resort of Bad Tölz, near Munich, Germany, from May 4 to 7, 1989. Our hosts will be the West German Society for the Scientific Investigation of Para-Science. Speakers will include European experts on topics of particular importance in Europe and members of the CSICOP Executive Council. Simultaneous translations into English, German, and Spanish will be provided.

Programs and registration forms will be mailed to all European subscribers to the SKEPTICAL INQUIRER (including those in the U.K. and Ireland). If you live outside Europe and would like to attend, write to Mary Rose Hays, CSICOP, Box 229, Buffalo, NY 14215, USA, for a copy of the program and registration form.

Pathologies of Science, Precognition, and Modern Psychophysics

Scientific investigation of controversial topics involves the search for more, better, less ambiguous, and more interpretable data. Claims of precognition and clairvoyance can be effectively evaluated by modern psychophysical procedures (signal-detection methods) that prevent several of the "pathologies of science."

Donald D. Jensen

IN PHILOSOPHY there are two different views as to the source of knowledge: (1) rationalism (the view that what is true is what is logical, rational, and self-consistent) and (2) empiricism (the view that what is true is what is consistent with the evidence of the senses, with what can be observed). Usually these two views are seen as competitors or opposites, but they can also be seen as independent and potentially complementary views. Mysticism is an example of reliance upon neither logic nor observation, but upon revelation or intuition; in contrast, science involves the use of both logic and experience, both reason and observation, to guide opinion.

DATA USED	Empiricism	Science
DATA NOT USED	Mysticism	Rationalism
	LOGIC NOT USED	LOGIC USED

Donald D. Jensen is a professor of psychology at the University of Nebraska–Lincoln. He is a comparative psychologist with a longtime interest in research methods and parapsychology.

Four Pathologies of Science

The combining of data and logic is not always easily or appropriately accomplished, as Stephen Jay Gould (1986) noted at the 1986 CSICOP conference in Boulder when he described four pathologies of science. The four pathologies he described can be labeled fraud, finagle, propaganda, and prejudice. *Fraud* refers to the manufacture of evidence or data "from whole cloth," to fiction masquerading as fact, to hoaxes of the grosser sort—like those effectively exposed several decades ago by Houdini (1924) and more recently by James Randi (1982). *Finagle* refers to minor hoaxes performed by "massaging the data" and to intentional systematic errors of observation, data description, or data recording that lead to misrepresentation of phenomena. Gould's discussion (1981) of early investigations of the brain weights of different races gives an excellent example of finagled data, but many scientists know of more recent cases in their own fields where data have been slightly modified, sometimes simply by the discarding of a few troublesome observations, to enhance the statistical significance of the data and to ensure publication of the research report. See Barber (1976) for discussion of a number of different frauds and finagles in human psychological research. See Klass (1983; 1988) for frauds and finagles in UFO reports, and Kusche (1975) for those relevant to the Bermuda Triangle.

It is important not simply to describe these four pathologies of science but to consider how to detect, correct, and prevent them. For the first two—fraud and finagle—this is usually accomplished in science by peer scrutiny and replication. Peer scrutiny is the critical and skeptical reading of research reports by other scientists. It may include reanalysis of data made available in the research reports or in archives. Replication is the process of repeating an investigation by another researcher, using another sample of subjects or another research method; a research finding is said to be replicated if substantially the same conclusions are reached in the repeat investigation as in the original one.

Any curious or unexpected finding is normally accepted only after having been scrutinized by other scientists without discovery of major flaws or omissions in research design, data gathering, data analysis, or argument. What is considered acceptable changes as research methods and statistical techniques develop and become standard practice; much research that was acceptable 25 or 50 years ago would be unpublishable today because some standard practices of that era were found to be flawed and have been supplanted by better methods. The publication of research reports and the reading of papers at scientific meetings are important because they facilitate this process of peer scrutiny, which has become easier and more effective as modern technology has become widely used in data collection and analysis. Modern researchers usually have a rich record verifying their data-gathering and analysis—data sheets, computer printouts, automatically produced charts and data reduction documents, and so on. Often it would be more work to fake such documents

convincingly than to do the research that would generate them. The scrutiny of skeptical peers may include examination of such data records, and investigators can protect themselves from charges of fraud and finagle by making detailed and original documents available to peers. See Roman (1988) for a popular account of a case where peer scrutiny uncovered fraud in the testing of a drug.

In the final analysis, the ultimate test of a scientific finding is its capacity for replication—the ability of others to do the same kind of research and get substantially the same data. Published reports of replication are enhanced by the same characteristics that make peer scrutiny effective: clear and detailed description of procedures for gathering data, of the data obtained, of the data analyses performed, and of the arguments made from those analyses. Peer scrutiny and replication are means of identifying frauds and finagles, and the threat of their occurrence almost certainly serves to discourage and limit the first two pathologies of science. But there are times when actual attempts at replication are necessary to identify frauds or finagles. One such example from my own research area is a report of learning in planaria (Griffard and Peirce 1964); letters requesting additional details to support replication of the study were not answered, and attempts to replicate the study produced data suggesting that the study would have been impossible to perform as described (Reynierse, Jensen, and Schroeder 1966). Here the threat of scrutiny and replication did not suffice, and an attempt to replicate was essential for the detection of a case of fraud or finagle.

The other two pathologies of science—propaganda and prejudice—are less easily detected, treated, or prevented. Propaganda refers to a pattern of selective presentation or marshaling of evidence for a preestablished point of view; ignoring or minimizing disconfirming data; and "accentuating the positive and eliminating the negative" in the discussion of and argument from the data gathered. Propaganda or biased presentation may be "good salesmanship" and acceptable in commercial affairs and certain legal realms, but it is considered inappropriate in science. A number of authors have recognized this as a problem in science (Chamberlin 1890; Platt 1984). Several decades ago, I encountered the practice while reviewing research on learning in paramecia and planaria (Jensen 1965). In one flagrant case, aspects of the data that contradicted the hypothesis that planaria can be classically conditioned to respond to light were hidden by the graphs and tables presented. Regraphing of the data clearly indicated that some other process was at work.

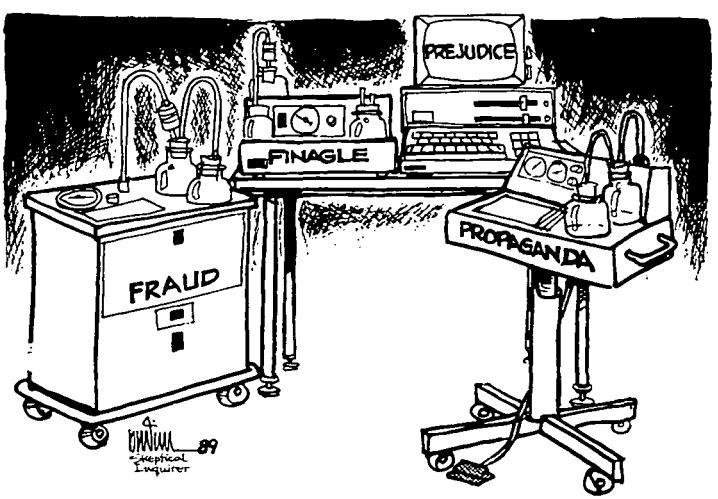
Scientific prejudice is the passive equivalent of scientific propaganda. It involves the acceptance of argument and data for a preestablished or favored point of view that would never be acceptable for a contrary opinion. It demands more of alternative ideas than is demanded of one's favorite ideas. It plays the game of science on an uneven field that favors one's own views.

Most readers of the SKEPTICAL INQUIRER see believers in the paranormal as examples of prejudiced evaluators who are much more responsive to evidence for the reality and mysterious nature of paranormal phenomena

than to evidence of their spurious or trivial nature. It may surprise some readers to hear that skeptics are held to be equally guilty of the sin of scientific prejudice. It has been argued that scientists have shown prejudice against extrasensory perception (ESP) by requiring greater amounts and a higher quality of evidence for ESP than for other findings. There may be more than a grain of truth in this view, but the demand for greater scrutiny and more and stronger data is triggered by *any* exceptional and unexpected finding; it is not just the paranormal that is given "extra-high hurdles" to jump.

Consider the literature on poison-aversion learning in experimental psychology. Extremely close scrutiny and unusually high demands for less ambiguous data were made of research that contradicted widely accepted views. Poison-aversion learning, also called the "Garcia effect," refers to very rapid learning of decreased preference for the novel flavors associated with gastrointestinal illness. This learning occurs with very long delays (hours rather than seconds) between taste and illness and with "backward associations" (i.e., when the flavor is tasted after the illness has begun); both conditioning with long delays and with backward pairing were deemed impossible by the theories of learning in vogue at the time the Garcia effect was first reported. Garcia's data were so unexpected and challenging that he had difficulty getting papers on this research published in major journals and in obtaining funds to continue his work. But the research did eventually pass peer scrutiny, it was soon and often replicated, and it is now a central part of the psychology of learning (Seligman and Hager 1972; Barker, Best, and Domjan 1977). Detailed and replicable data convinced the doubters, silenced the skeptics, and encouraged a host of other researchers to work on the topic.

Any novel and unexpected phenomenon or view must be evaluated especially critically and subjected to attempted replication. The purported



phenomenon is accepted when more and better data accumulate; or, if that is not the case, it is shelved, becoming part of the history of a field rather than an area of active research. The search for less ambiguous data characterized the controversies over learning in planaria and the Garcia effect. In one case (learning in planaria) this evidence was not generated, but in the other case (the Garcia effect) it was. The data showing one-trial learning of taste-aversions with long time intervals between taste and illness in many species and settings accumulated. Controversy was replaced by eager acceptance of the phenomenon and rapid development of a research literature.

It appears, then, that scientific investigation of a controversial topic involves the search for more, better, less ambiguous, and more interpretable data and use of the best available methods of research. While the search for *more* data can be subsumed under replication, the search for *better* data (data that are more interpretable, less ambiguous, more convincing, more nearly irrefutable, etc.) goes beyond replication and involves the improvement of research methods. Better data may be obtained by improving observational methods (improving reliability and providing checks on authenticity and accuracy), increasing the power of experimental manipulations and controls, improving research designs (adding placebo controls, using double-blind procedures, etc.), and by improving the methods by which data are summarized and interpreted.

One of the advantages of statistical testing of data is that it provides clear and relatively neutral or unbiased methods of summarizing and evaluating data. Standard descriptive statistics provide useful tools for understanding large data sets and "seeing the forest rather than the trees." Standard tests of statistical significance ask whether the data depart from chance expectation sufficiently to make chance an unreasonable explanation. Most scientists now routinely ask this question of all data sets used as evidence, and only those that pass this criterion of statistical significance are normally accepted as evidence for or against any theory.

Given that better data and better methods of data analysis can protect against scientific propaganda and prejudice, what kind of data would be the best possible evidence for clairvoyance or precognition? What kind of data would an unbiased modern investigator find acceptable and worthy of serious consideration?

Needed: Unambiguous Data for Precognition

The evidence normally offered in the popular press for paranormal perception is the individual case of apparent precognition. This is the report of a hunch or a feeling or fear that an event would occur, followed by a verified occurrence of the feared event. Such events are frequently reported to bridge great distances to signal catastrophes occurring to close relatives or friends. A number of alternative explanations have been offered for such reports, including retrospective falsification and memory distortion (a kind of finagle) as well as

fraud. These are important possibilities, but the point of this article is a very different one—that even in the absence of fraud and finagle, such cases are not and never can be, acceptable evidence for clairvoyance. The reason for this has to do with the inevitable ambiguity of evidence gathered by a research method in which a stimulus is always presented.

Early Psychophysical Methods

The "method of limits" is one of the standard research techniques of classical psychophysics. One of its uses involves giving stimuli that vary in intensity and asking the subject to indicate whenever the stimulus or signal is detected. The data are typically analyzed by grouping responses by stimulus intensity and computing the proportion or percentage of responses given to each stimulus intensity. The data are then graphed with percentage of responses displayed on the vertical axis. (See Figure 1.)

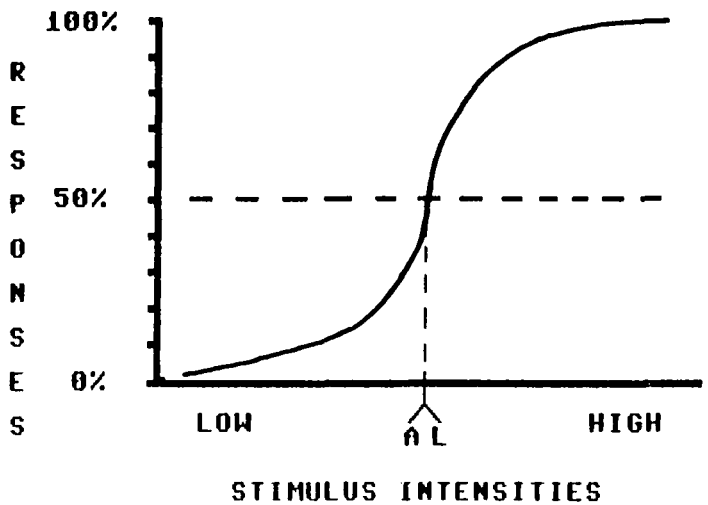


FIGURE 1

The absolute limen (AL) or absolute threshold of stimulation is usually identified as that intensity of stimulation expected to produce a response 50 percent of the time; the absolute threshold was the standard measure of sensitivity to stimulation for almost 100 years. The method of limits and reports of clairvoyance differ in many regards (i.e., only the first involves systematically varying intensity of stimulation), but they resemble each other in that both involve only stimulus-present situations or trials. In both cases, there is always a stimulus or signal present, and the question is whether the person detected the signal. In both, a response is considered to be evidence of detection of a signal.

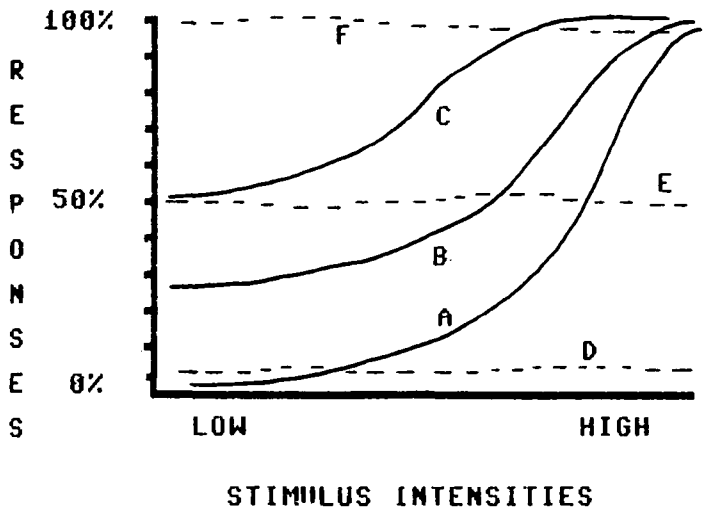


FIGURE 2

Sometimes this evidence for stimulus detection is relatively unambiguous, as when a subject never responds to weaker intensities of stimulation, sometimes responds to middle intensities, and always responds to stronger intensities. Here a simple rule works well to provide a measure of sensitivity to stimulation. The rule is to determine the 50-percent point, the amount of stimulation expected to produce response 50 percent of the time.

The data can be ambiguous if certain other patterns of responding occur. (See Figure 2.) Consider several different sets of data. Curve A represents the "good subject" described in the last paragraph. Curve B represents a subject who says yes occasionally at all intensities of stimulation, but more often at higher intensities. Curve C represents a subject who says yes about half the time at lower intensities, with the response rate increasing at higher intensities. Curves A, B, and C represent subjects whose responses are related to stimulus intensity, but differ in general tendency to say yes, in what is called "response bias." This general tendency undermines the validity of the standard method of computing the absolute threshold (determining the 50-percent point), since curve B has less far to go to get to the 50-percent level, and curve C starts there!

The other three patterns of data show another complication. Curves D, E, and F (dotted horizontal lines) represent subjects who say yes at different rates (seldom, half the time, and always) but do so in a way unrelated to the intensity of the stimulation given. Curve E can be produced by someone who tries to do what is asked, and so says yes part of the time, but doesn't seem to be able to detect stimuli at any of the intensities used; this subject shows a

moderate response bias and no ability to detect the stimuli. But what about curves D and F? These two patterns of data are ambiguous. The top dotted line (curve F) could represent either a person who was sensitive to all of the stimulus intensities sampled or a person who simply said yes all the time. The bottom dotted line (curve D) could represent either someone who was deaf or blind to the stimuli being presented or someone who was uncooperative and never said yes.

To tell the difference between indiscriminate responding (response bias) and detection of a signal or stimulus, trials in which no signal or stimulus is given are necessary. If the subject responds on trials when the stimulus is present but not on trials when the stimulus is absent, then there is relatively unambiguous evidence that the subject is detecting the stimulus. On the other hand, if responses are just as likely in the presence of a stimulus as in its absence, then the subject shows a tendency to respond (response bias) but no ability to detect the stimulus. Mixtures of response bias and signal detection are evident when responses occur in the absence of the stimulus but are more likely in the presence of the stimulus.

A standard terminology exists for discussing data from research with both stimulus-present and stimulus-absent trials. If stimulus-absent trials occur only occasionally, they are called "catch" trials, since they are intended to catch or identify subjects who show indiscriminate responding. If stimulus-absent trials occur frequently, the following nomenclature is used to describe the four possible combinations of two kinds of response (yes and no) with two kinds of trials (stimulus-present and stimulus-absent).

	YES	NO
STIMULUS PRESENT	Hit (Correct Positive)	Miss (Incorrect Negative)
STIMULUS ABSENT	False Alarm (Incorrect Positive)	Correct Rejection (Correct Negative)

RESPONSE

A subject who responds when a signal is present scores a "hit" or makes a correct positive response. A subject who responds when a stimulus is absent gives a "false alarm" or makes an incorrect positive response. A subject who does not respond when a stimulus is present is scored for a "miss" or an incorrect negative response: A subject who does not respond when the stimu-

lus is absent is scored for a correct rejection or a correct negative response. Data from one level of stimulation are evaluated, not by percentage of "yes" responses given at that level of stimulation, but by the set of four percentages obtained at that level. The data from a modern psychophysical experiment would include one table of four percentages for every level of stimulus investigated.

Perfect detection of a stimulus intensity that is presented on half of the trials is shown by the following data:

50% hits	0% misses
0% false alarms	50% correct rejections

Perfect detection is shown by "yes" responses only in the presence of the signal; all such responses are hits or correct rejections.

No detection is shown when there are equal numbers of hits and false alarms, even though the percentage of hits may vary. No detection is shown by the two data sets shown below, but they differ in the amount of response bias shown. The first data set shows a low general tendency to say yes, or a low response bias; the second set shows maximal response bias (*always* saying yes).

Low Response Bias Without Signal Detection

10% hits	40% misses
10% false alarms	40% correct rejections

Maximal Response Bias Without Signal Detection

50% hits	0% misses
50% false alarms	0% correct rejections

Both of the above sets of data represent 50 percent correct responses (the sum of hits and correct rejections) but the meaning of 50 percent correct is very different in the two cases, since the second set of data shows much greater response bias.

A mixture of detection and response bias is shown by the following data in which there are more hits ("yes" when stimulus present) than false alarms ("yes" when stimulus absent):

Moderate Response Bias and Moderate Signal Detection

40% hits	10% misses
25% false alarms	25% correct rejections

Graphing Detection and Bias: ROC Curves

All possible data sets of the type just discussed can be shown on a diagram produced by representing each set of data by a single point on a graph. (See Figure 3.) The vertical axis represents the percentage of hits and the horizontal axis represents the percentage of false alarms. A single point can represent the set of four values if equal numbers of signal-present and signal-absent trials are given, since the other two can be obtained by subtraction. This kind of diagram is called an ROC diagram; ROC stands for Receiver Operating Characteristic, a term that, along with response bias, signal detection, hits, misses, false alarms, and correct rejections, is a legacy from electrical engineering, where the data-analysis methods we have been discussing were developed to aid the evaluation of radar devices (Green and Swets 1966).

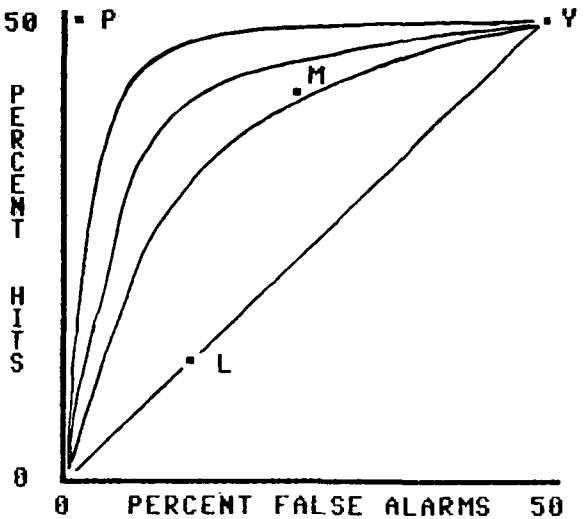


FIGURE 3

Any set of data with equal percentages of hits and false alarms and corresponding to no detection would lie on the diagonal running from the lower left to the upper right. The ROC diagram graphically separates signal detection from response bias, and data obtained using signal-detection methods are unambiguous. The person who says yes only when the signal is present (perfect signal detection) is located in the upper left corner of the ROC diagram (point P): The person who says yes on every trial (maximal response bias) is in the upper right corner on the line of bias without detection (point Y). The person who says yes on one-fifth of the trials but without regard to the presence or the absence of the signal is shown lower on the line of bias without detection (point L). The person who says yes most of the time when the stimulus is present and half the time when the stimulus is absent is shown above the diagonal of bias without detection (point M).

Mixtures of different amounts of signal detection and response bias are represented by points on the ROC diagram located above and to the left of the diagonal of no detection. Equal amounts of detectability are shown along contours running in bow-shaped curves from the lower left to the upper right corners of the ROC diagram. The standard way to represent stimulus detectability and response bias is by use of two different numerical values, d' (d-prime, which reflects detectability of signals) and beta (which reflects response bias). It is d' that normally varies as a function of stimulus intensity and replaces absolute threshold as an index of performance in modern psychophysical research. The exact procedures by which values of d' and beta are calculated is of little interest here, but the difference between signal detectability and response bias is crucial to our discussion.

Application to Precognition

Signal-detection methods have been widely used in modern psychology. Their rapid acceptance into psychology is understandable because they separate detectability (of interest to psychologists studying sensory and simple perceptual processes) from response bias (of interest to psychologists studying motivation, personality, and psychopathology). Modern sensory psychology and neurophysiology provide explanations for the remarkable capacities that exist for signal detection; other kinds of psychology provide multiple alternative and supplementary explanations for response bias. For example, various kinds of epileptic conditions (Beyerstein 1988) and schizophrenia are characterized by hallucinations (perceptions without external referents, sensory responses without signals, "false alarms").

Drugs, sleeplessness, and sensory isolation produce mild and brief sensory disturbances in normal individuals. High arousal and sustained stress tend to increase false alarms, as when deer hunters shoot at cows and other hunters as well as deer, or when sentries shoot at nonexistent intruders. Ellson (1941) demonstrated that hallucinatory responses could be produced in normal subjects by classical conditioning. This was accomplished by following a "ready" signal by a tone that increased and then decreased in intensity but did not have an abrupt onset or offset. After a number of trials, the "ready" signal was given without being followed by any tone at all. Subjects pushed buttons to report hearing the tone and were adamant that the tone had in fact occurred. The behavior of Ellson's subjects was evidence that they had received the "ready" signal, but not that the tone had sounded.

While all of these varied explanations must be considered in analyzing evidence for detection of distant and future events (i.e., clairvoyance and precognition), they are all explanations for response bias, not for stimulus detectability.

Now let us apply the ideas of response bias to a real-life situation. It is graduation night at the local high school. Several hundred seniors are leaving the ceremony for parties and social activities. Mothers are worried: Will there

be terrible auto accidents on this night-of-nights for high school seniors? If we substitute "Mother's Worry" for "Yes Response" and substitute "Catastrophe Occurs" for "Signal Present," we can use the now-familiar terms of hits, misses, false alarms, and correct rejections.

CATASTROPHE OCCURS	Hit	Miss
NO CATASTROPHE	False Alarm	Correct Rejection
	MOTHER'S WORRY	NONE

When a mother worries, and something terrible happens to her child, the popular press and an unsophisticated observer would say: "A case of precognition, clairvoyance, ESP, mysterious power of the human mind, etc." The more sophisticated observer would note the hit but would ask as well about the number of false alarms. It is plausible that most mothers of graduating seniors will worry, and most will feel relief when their darlings return unharmed if tipsy from their graduation parties; false alarms are common on graduation nights. But let a catastrophe occur, and the same response bias that produced many false alarms can produce a hit by chance and chance alone. It is important to note that only the "hits" are likely to be remembered or publicized. Unfortunately, human memory is very selective; we remember hits (cases of fear followed by catastrophe) and misses (cases of unexpected catastrophe) much better than false alarms (fear followed by no catastrophe). False alarms (fear without catastrophe) and correct rejections (no fear and no catastrophe) are normal daily events that we usually neither name nor count. Further, only "hits" are newsworthy, and published accounts of "hits" represent only one of the four kinds of events. Newspapers do not report misses, false alarms, or correct rejections.

To interpret hits effectively, one needs information on all four classes of events, and not just information about hits. Given such data, and evidence that other classes of events are as faithfully reported as are hits, one could obtain relatively unambiguous evidence of signal detection (i.e., statistically significantly greater percentage of hits than false alarms). Such information, on false alarms, misses, and correct rejections, as well as on hits, is difficult but not impossible to obtain. One could, for example, ask students in large classes to predict, each time they come to class, whether a major domestic airline crash (more than 10 fatalities within the United States) is to occur between that and the next class meeting. Over several semesters, this procedure should produce a number of hits (students saying yes when a catastrophe

does occur before the next class meeting), misses (students saying no when a catastrophe does occur), false alarms (yes when a catastrophe does not occur), and correct rejections (no when no catastrophe occurs), and these data could show signal detection as well as response bias. But note that no single case of fear followed by catastrophe, no matter how detailed and remarkable, is acceptable evidence for precognition or clairvoyance, because all four kinds of events must be observed to obtain relatively unambiguous data for signal detection.

Modern psychophysics, with its separation of response bias and signal detection, offers an improved paradigm for investigating paranormal perceptions. At an informal level, that paradigm is already being used. The editors of the SKEPTICAL INQUIRER frequently report more than the hits that professional psychics report; they count misses (Chernobyl, the Challenger disaster, the volcanic eruption in Colombia, etc.) and false alarms (predictions that fail to occur). There are, of course, other ways of dealing with response bias as a contaminating influence upon data; formal tests of paranormal abilities can be designed so that the effects of response bias are controlled or prevented. A dowser, for example, might be tested by having half of a sample of pipes containing flowing water or half a set of cans containing precious metal, with the dowser instructed to identify only half of the stimuli as positive cases. Response bias is prevented in many psychophysical procedures by presenting stimuli intervals in pairs, one with and one without the signal, and allowing the subject being tested to select one and only one of each pair as the positive case. This has the effect of requiring simultaneous pairs of yes and no responses and preventing response bias; data of this kind, like that obtained when half the trials involve stimulus-absent conditions, can show stimulus detection (more correct choices than incorrect), zero detection (equal numbers of correct and incorrect choices), and "worse than chance" responding (fewer correct than incorrect choices). Statistical significance of differences from chance responding then can be estimated by a variety of statistical tests.

In general, the pathologies of propaganda and prejudice can be prevented by use of modern research methods, such as those for separating response bias and signal detection, and by formal testing that prevents response bias. While modern research methods do not guarantee freedom from fraud, finagle, propaganda, or prejudiced evaluation of data and argument, they can make these pathologies of science less likely to occur in the investigation of normal and of purportedly paranormal phenomena.

Summary

Modern psychophysics has methods for producing relatively unambiguous data relevant to precognition and clairvoyance. These methods make possible the separation of signal detection and response bias by the study of hits, misses, false alarms, and correct rejections. Experimental procedures can also be used to eliminate response bias in tests of paranormal perception. Con-

temporary psychology provides many explanations for response bias that may masquerade as detection in situations in which only stimulus-present trials are considered. Modern psychophysical methods are one of the antidotes available for the pathologies of science (fraud, finagle, propaganda, and prejudiced evaluation). These methods require attention to all relevant data, and not just to "hits," which may result from either signal detection or response bias.

References

Barber, T. X. 1976. *Pitfalls of Human Research.* New York: Pergamon Press.

Barker, L. M., M. R. Best, and M. Domjan. 1977. *Learning Mechanisms in Food Selection.* Waco, Tex.: Baylor University Press.

Beyerstein, B. L. 1988. Neuropathology and the legacy of spiritual possession. SKEPTICAL INQUIRER, 12:248-262.

Chamberlin, T. C. 1890. The method of multiple working hypotheses. Reprinted in *Science,* May 7, 1965.

Ellson, D. 1941. Hallucinations produced by sensory conditioning. *Journal of Experimental Psychology,* 28:1-20.

Gould, S. J. 1981. *The Mismeasure of Man.* New York: Norton.

———. 1986. Keynote address, CSICOP Conference, Boulder, Colorado, April 25, 1986.

Green, D. M., and J. A. Swets. 1966. *Signal Detection Theory and Psychophysics.* New York: Wiley.

Griffard, C. D., and J. T. Peirce. 1964. Conditioned discrimination in the planarian. *Science,* 144:1472-1743.

Houdini, H. 1924. *A Magician Among the Spirits.* New York: Arno Press.

Jensen, D. D. 1965. Paramecia, planaria, and pseudolearning. *Animal Behavior Supplement,* 1:9-20.

Klass, P. J. 1983. *UFOs: The Public Deceived.* Buffalo, N.Y.: Prometheus Books.

———. 1988. *UFO Abductions: A Dangerous Game.* Buffalo, N.Y.: Prometheus Books.

Kusche, Larry. 1975. *The Bermuda Triangle Mystery—Solved.* Reprinted in paperback by Prometheus Books. Buffalo, N.Y., 1984.

Platt, J. R. 1984. Strong inference. *Science,* 146:347-353.

Randi, J. 1982. *Flim-Flam.* Buffalo, N.Y.: Prometheus Books.

Reynierse, J. H., D. Larson, and D. D. Jensen. 1966. Shock duration and adhesion in the planarian, Phagocata gracilis. *Psychonomic Science,* 8:269-270.

Roman, M. B. 1988. When good scientists go bad. *Discover,* 9(4):50-58.

Seligman, M. E. P., and J. L. Hager. 1972. *Biological Boundaries of Learning.* New York: Appleton, Century, and Crofts. •

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A Reaction-Time Test of ESP and Precognition

Experiments using reaction time rather than accuracy measures were proposed to test the hypotheses of ESP and precognition. When these tests were undertaken in the laboratory, no evidence of these abilities was found.

Terence M. Hines and Todd Dennison

REACTION-TIME (latency) measures are ubiquitous in cognitive psychology. Their widespread use can be directly traced to their sensitivity. Effects that are readily apparent with latency measures will usually not be seen with accuracy measures. It is therefore somewhat surprising that researchers in parapsychology have relied almost exclusively on accuracy measures in studies attempting to find evidence of extrasensory perception (ESP) and related phenomena.

Apparently, there has been only one experiment that used a reaction-time measure to search for evidence of ESP. Hines, Lang, and Seroussi (1987) modified a lexical decision task (Shoben 1982) so as to be able to detect extrasensory automatic activation in semantic memory. In the standard lexical decision task, strings of letters are presented to a subject who must decide whether the string is a real word (e.g., "DOOR") or not (e.g., "DOOL"). If the letter strings on two consecutive trials are semantically related, reaction time to classify the second string as a word will be shorter (Shoben 1982). This semantic priming effect takes place automatically in the semantic memory system and does not seem to depend on the subject's conscious awareness of the semantic relationship or on conscious strategies the subject uses (Fishler 1977). In their ESP condition, Hines, Lang, and Seroussi (1987) modified the lexical decision task by presenting a letter string to one subject, the "sender," and 400 milliseconds (ms) later presenting either the same or a different letter string to a second subject, the "receiver." In a control condition, a single subject made lexical decisions on the same set of letter strings seen by the "receiver" in the ESP condition.

Terence Hines is associate professor of psychology at Pace University. At the time of this study Todd Dennison was one of his students.

If semantic priming can occur via some extrasensory channel, then the receiver's reaction time should be faster when the sender has just, 400 ms previously, processed the same letter string. Further, and most important, any such effect should disappear in the control condition where one subject is making decisions about letter strings with no extrasensory input from any sender.

Hines, Lang, and Seroussi (1987) found no evidence for an extrasensory semantic priming. Receivers' responses to letter strings that had been processed 400 ms previously by a sender were 88 ms faster than their responses to letter strings that had not been previously processed by a sender. At first blush, such a finding seems supportive of extrasensory influences. However, even in the control condition, those letter strings that in the ESP condition were processed by the sender just before the receiver saw them were responded to 87 ms faster than letter strings that, in the ESP condition, were not processed before by the sender. In other words, one subset of the letter strings used in the experiment was responded to faster whether or not there was a sender present. This difference, which was almost identical in the ESP and control conditions, was very likely due to uncontrolled variables, such as word frequency, number of meanings, and so on, that are known to exert strong influences on reaction time in the lexical decision task.

One failure to find a phenomenon does not a refutation make, of course; and we report here a second attempt to find evidence of extrasensory processing using a reaction-time measure.

Experiment 1

Schmidt (1970) has reported success in obtaining evidence for psi in a paradigm in which subjects try to influence the output of a random-number generator. While doubts have been raised about the technique (Hyman 1980-1981) we were attracted to the random-number concept and built a reaction-time experiment around it. We also investigated the claim that feedback enhances psi abilities.

In this experiment, subjects had to decide whether a digit displayed on a television screen was the same as or different from the one stored in an Apple II computer's memory. Reaction time to make this decision was recorded, on-line, by the computer. Accuracy was also recorded. If ESP is a real phenomenon, and a strong one, one would predict that subjects should score above chance (50%) when measured by their accuracy. However, it is at least conceptually possible to envision a system in which ESP is real but too weak to influence the choice of the response. It might still influence the speed of the response, resulting in correct decisions being made faster than incorrect ones. The basic hypothesis, then, was that no above-chance accuracy scores would be obtained, but that, if ESP exists, subjects' correct responses would show shorter reaction times than their incorrect responses.

Subjects. Subjects were 38 Pace University undergraduates who received

$5 or extra credit in their introductory psychology class for participating.

Design and Procedure. Subjects were tested individually and were randomly assigned to either an Accuracy Feedback or a No Accuracy Feedback group. The Accuracy Feedback group received feedback after each trial informing them of whether their response had been correct and of their reaction time for that trial. Subjects in the No Accuracy Feedback condition received no feedback about whether their responses were correct, but did receive feedback informing them of the speed of each response.

A trial started when the computer generated a random "0" or "1" and stored it in memory. Immediately thereafter, the computer generated a second random "0" or "1" and displayed it at the center of an 11-inch closed-circuit Sony TV monitor. The subject made his response by pressing one of two buttons on a hand-held response device. The left thumb was to be used to press the left button when the subject judged the displayed digit to be the same as that stored in the computer's memory. The right thumb was used to press the right button when the subject judged the two digits to be different. Subjects were instructed to respond using whatever method or strategy they wished. Although some subjects were at first a bit puzzled by the task, all performed readily. Following the subject's response, the digit was removed from the screen and the appropriate feedback was presented. The feedback remained on the screen for 500 ms (half a second). It was followed by a blank 1,000-ms (one-second) intertrial interval, after which the next trial commenced. If a subject failed to respond in 3,276 ms, the computer provided "too slow" as feedback and went on to the next trial.

Results and Discussion. No evidence of ESP was found in the accuracy data. In the No Accuracy Feedback condition 48.9 percent of responses were correct and 48.8 percent were incorrect. In the Accuracy Feedback condition, 50.0 percent of the responses were correct and 48.8 percent incorrect. These figures do not add to 100 percent because of a small number of trials on which the response exceeded the limit of 3,276 ms.

A three-way analysis of variance (Response Type × Response Accuracy × Feedback Condition), with Feedback Condition a between-subjects variable, was performed on the reaction-time data. The only effect to reach significance was the main effect of Response Type ($F(1, 36) = 4.54$; $p = .037$). This is due to "match" responses being faster than "doesn't match" responses (432 ms vs. 449 ms).

Had ESP been operating, we should have found that correct responses had faster reaction times than incorrect responses. There was not a hint of such an effect.

Experiment 2

This experiment is very similar to Experiment 1, with three exceptions. First, since there was no effect of feedback condition in the first experiment, all subjects were given accuracy feedback in this experiment. Second, this was an

TABLE 1. Reaction Time (in milliseconds) as a Function of Response Accuracy, Type, and Feedback

			RESPONSE ACCURACY			
			Correct		Incorrect	
			Mean	Standard Deviation	Mean	Standard Deviation
ACCURACY FEEDBACK	Response Type	Match	428	181	433	162
		Doesn't Match	449	188	437	176
NO ACCURACY FEEDBACK	Response Type	Match	433	185	433	174
		Doesn't Match	463	187	449	186

experiment in precognition, not ESP. The computer first generated a random "0" or "1" and displayed that digit on the monitor. The subject then made a reaction-time response based on whether he or she believed that the displayed digit would match or not match a second digit that the computer generated only *after* the response. Finally, 20 subjects participated. In all other respects, Experiment 2 was identical to Experiment 1.

Results and Discussion. No evidence for precognition abilities was found in the accuracy data. Correct responses accounted for 50.3 percent of the total; and incorrect responses, for 49.7 percent. There were no responses with latency of over 3,276 ms, so these figures sum to 100 percent.

A two-way analysis of variance (Response Type × Response Accuracy) was performed on the reaction-time data. Only the main effect of Response Type achieved significance ($F(1, 19) = 4.99$; $p = .035$), with "match" responses being slower than "doesn't match" responses (484 vs. 462 ms). Had precognitive abilities been present, we would have expected that correct responses would have had shorter latencies than incorrect responses. As in Experiment 1, there was no such effect in the data.

TABLE 2. Reaction Time (in milliseconds) as a function of Response Accuracy and Response Type

		RESPONSE ACCURACY			
		Correct		Incorrect	
		Mean	Standard Deviation	Mean	Standard Deviation
Response Type	Match	484	190	484	160
	Doesn't Match	456	160	468	179

General Discussion

Our failure to find evidence for ESP or precognition in the two experiments reported here is certainly not definitive proof that such phenomena do not exist. As Blackmore (1986-1987), among others, has pointed out, it is impossible to disprove the existence of psi, or any other type of phenomenon. However, the fact that we have used a method that has a long history of being much more sensitive as a measure of even very small effects in cognition without even a hint of psi phenomena increases our confidence that such phenomena are not real.

We fully expect that other investigators will begin to use reaction-time measures in studies of psi. Indeed, we would encourage the use of this measure precisely because of its greater sensitivity when compared with traditional accuracy measures. However, it must be borne in mind that reaction-time measures are not a panacea. There are numerous, often very subtle, variables that affect reaction time and could easily be mistaken for psi findings if appropriate controls are not used. The investigator who uses reaction-time measures in parapsychological experiments must first become familiar with the large literature on their use in nonparapsychological situations.

References

Blackmore, S. 1986-1987. The elusive open mind: Ten years of negative research in parapsychology. SKEPTICAL INQUIRER, 11:244-255.

Fishler, I. 1977. Associative facilitation without expectance in a lexical decision task. *Journal of Experimental Psychology: Human Perception and Performance,* 3:18-26.

Hines T., P. Lang, and K. Seroussi. 1987. Extrasensory perception examined using a reaction-time measure. *Perceptual and Motor Skills,* 64:499-502.

Hyman, R. 1980-1981. Further comments on Schmidt's PK experiments. SKEPTICAL INQUIRER, 5(3):34-40.

Schmidt, H. 1970. A PK test with electronic equipment. *Journal of Parapsychology,* 34:175-181.

Shoben, E. 1982. Semantic and lexical decisions. In C. Puff, ed., *Handbook of Research Methods in Human Memory and Cognition.* New York: Academic Press, pp. 288-314. •

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Report of a Chinese Psychic's Pill-Bottle Demonstration

Wu Xiaoping

What follows is a slightly edited version of a report of the testing of a Chinese psychic's claimed abilities. Zhang Baosheng, a middle-aged citizen of the People's Republic of China, has given many demonstrations of his power to remove pills (usually of vitamin C) from sealed bottles—without opening the bottles. These demonstrations have been viewed by many top officials of the government in China, and they have endorsed Zhang as having genuine psychokinetic power.

As a conjuror, it occurred to me that such a feat could be performed as a trick merely by having available a small supply of pills identical to those in the bottle. After a suitable period of time, it would be an easy matter to place a few loose pills under the bottle as it was held in the hand and allow them to fall as if they had penetrated the bottle. Indeed, a description of Zhang's usual performance given to me by several observers seemed to match such a possible modus operandi.

The following report was written by Wu Xiaoping, a science journalist who served as an observer and interpreter for the CSICOP team who visited China recently. Wu was initially quite unfamiliar with methods of investigating such claims, but by observing the CSICOP group she and Jian Ding, now a student at UCLA, soon developed the expertise to be able to design simple, definitive experiments.

Wu called in Ti Yueli, a magician from Beijing who performs an excellent and highly specialized conjuring act. Ti, as will be seen from this report, was a valuable observer who contributed to Wu's success in the investigation.

At Wu's request, I suggested by mail a few possibly useful precautions she might want to introduce into her tests, though I feel that she is an astute observer and quite capable of designing a test with proper controls. It turned out that she was unable to implement some of my suggestions. I had recommended, for example, that only a small group of observers be present for such a demonstration, to get around the distraction and confusion that might result from a larger number. Also, I suggested that only one bottle be used at a time and that careful surveillance should be applied to all other materials. These conditions were beyond Wu's control, since Zhang's "test" turned out to be more of a show than an experiment—very much like the "tests" of Uri

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Wu Xiaoping is a science reporter for Science & Technology Daily, *Beijing, China. She was an observer at CSICOP's tests in China in late March 1988.*

Geller at the Stanford Research Institute in the 1970s.

Even lacking this control, Wu and Ti demonstrated convincingly that Zhang Baosheng's claims are highly doubtful. I believe that other members of the CSICOP team who visited China with me will be pleased that we planted seeds there that could lead to many similar inquiries by other diligent skeptics.

The demonstration took place May 13, 1988, in Beijing. The intent was to see if Zhang Baosheng could remove some of the pills from a sealed bottle without opening the bottle, and read a sealed written message.

—JAMES RANDI

CARRIED OUT before a crowd of more than 50 people, including high-ranking officials and scientists, Zhang Baosheng's five-hour-long demonstration was preceded by a two-hour introduction. Though the performer himself claimed to have "great paranormal power," and the newspapers supported that claim, his demonstration offered no evidence of that power. Moreover, this test of his abilities could not be considered a scientifically strict experiment because neither the subject nor the samples used in the demonstration were under any control during the entire period of the experiment. For example, Zhang left and reentered the room *11 times* without supervision!

A week before the demonstration, three kinds of samples were jointly prepared by Zhang's colleagues and myself, who had varied points of view regarding the paranormal. One sample involved a piece of spring steel, one had 20 pieces of square-marked plastic, and another consisted of a sealed paper with a message written inside. All the test bottles and tubes were sealed, some by melting. Of each kind of sample, there were ten from which Zhang could choose. These unique and tamper-detectable samples were admitted by participants as the only formal testing samples.

The Performance. Closely watched by author Wu (*right*), Zhang (*center*) produces pills from the bottom of the bottle. Zhang's fans are applayding this miracle. At extreme left, the wife of a Chinese magician, Luo, also observes. (Photo courtesy of Wu Xiaoping.)

The Moment of Truth. Over the objections of Zhang's followers, Wu (seated at lower right) reveals that all four seals on the pill bottle have been broken. (Photo courtesy Wu Xiaoping.)

Unfortunately, after repeatedly applying his "super powers" to the task with great diligence, Zhang failed to produce any effect (let alone a miracle) on the samples, though his colleagues tried hard to convince all those present that he had been successful with this sort of test many times in the past.

Zhang did apparently manage to remove some pills from two bottles (samples "A" and "B") that had been supplied by his colleagues. This demonstration, which was claimed to be "only a small example of his super power," left quite a bit to be desired. Examination of sample "A" showed that it had lost the adhesive tape that had been on the lid before the demonstration; "B" had only half of its marked label left, and the weight of the "removed" pills plus the weight of the "remaining" bottle-plus-pills was 12.2 grams heavier than sample "B" had been at the start.

Another test deemed "successful" by Zhang's colleagues involved a sample ("C") offered by me. This was a plastic bottle with 30 capsules sealed inside. Any attempt to open the bottle would irrevocably break the four points connecting the body to the lid. Zhang was cautioned not to break the points, and the connections were protected by tape against inadvertent damage. At the beginning of the demonstration, Zhang refused to attempt this test, complaining that the plastic had "a strange smell." However, after three hours—during which time that sample had been out of everyone's range of observation, and Zhang had left the room, unsupervised, several times—he asked to be able to use sample "C" in a demonstration. He then "moved out" of the bottle 17 capsules and one pill, the same kind as those in samples "A" and "B." He then said he had "moved in" a piece of chocolate wrapped in *torn*

The "Move." Zhang puts the substitute envelope into the hands of a sympathetic observer. The test envelope is now in his pocket. (Photo courtesy Wu Xiaoping.)

red paper, chosen from chocolates offered by his colleagues.

At the conclusion of this test, I checked the bottle and showed the results to all present. All four connecting points that sealed the bottle and lid together had been broken. Inside the bottle were 13 capsules and a chocolate—but this one had *untorn* red wrapping paper. Everyone there, including Zhang's colleagues, agreed with my observations.

It was interesting to note that Zhang lost his "magic powers" in the presence of a magician, Ti Yueli. It happened when Zhang was performing his stunt of reading Chinese characters sealed inside an envelope. This sample was prepared by Lin Zixin (editor of *Science & Technology Daily,* sponsor of the CSICOP team) and He Zuoxiu, a physicist who had attended the first CSICOP discussion in Beijing. This envelope had been secretly marked for identification on the outside. Zhang folded the envelope and handed it to one of the main experimenters. He told us that he would reveal the written contents when he returned in 15 minutes. When Zhang left the room, Ti informed the spectators that he had observed Zhang exchanging the envelope for another one that Ti had seen him secretly place under his seat when he had reentered the room previously. Ti had seen Zhang quickly placing the original, marked envelope into his pocket, unnoticed by everyone else. The experimenter who had been given the envelope by Zhang unfolded it at once and found that Ti was right in his observations.

When Zhang returned to the room, he decided not to proceed with his demonstration, which his colleagues had described as a "very simple" one, and he would not comment on our observations.

There is a saying that seems to apply to Zhang Baosheng's demonstration: "Sometimes he's wrong; sometimes he's not right." •

The Kirlian Technique: Controlling the Wild Cards

The Kirlian effect not only is explainable by natural processes; it also varies according to at least six physical parameters.

Arleen J. Watkins and William S. Bickel

IN A PREVIOUS article in this journal (Spring 1986), we investigated a number of claims put forth by Kirlian researchers. We were able to satisfactorily explain the aura and the variations in auras by natural physical laws. The aura was found to be highly dependent on two properties in the sample: conductivity and surface arrangement of conducting areas. We suggested that any serious study using Kirlian photography would have to control the physical parameters as a requisite to pursuing realistically any claims about the aura's containing information about the physiological, psychological, and psychic state of the individual, or about the life-force or life-energy of the living object.

The purpose of this study was to show how the aura is affected by variations of physical parameters, thereby reemphasizing the need for control of these parameters. The parameters considered in the study were: (1) photographic paper, (2) pressure with which sample is held on the plate, (3) voltage discharge, (4) exposure time, (5) moisture in sample, and (6) photographic development time.

In this study, the surrounding medium was air. All pictures were taken of the same finger of the same person. The high-voltage discharge pictures were taken within one hour on the same day, and the low-voltage discharge pictures were taken within one hour, one week later. Figure 1a shows the effect of overexposure in developing the film. Notice the wide, undifferentiated aura associated with long exposure time. Figure 1b shows the marked contrasts between dry and moist fingers. Notice the sharp, differentiated detail in the aura of the moist fingers as compared with the finer, less differentiated detail in the aura of the dry fingers.

We used Kodak single-weight photographic paper: Kodabromide F1, F3,

Arleen J. Watkins is in the Department of Family and Community Medicine, College of Medicine, and William S. Bickel is in the Department of Physics, both at the University of Arizona, Tucson.

and F5; Dektol Paper Developer; and Kodak Rapid Fix. Because we wanted a well-differentiated aura, we set the development time at 8 seconds for F1 and F3 photographic paper, and 2 seconds for F5 paper. To maintain better control, we decided to use only normal, dry fingers.

Photographs of auras made with the three photographic-paper types are shown in Figures 2 and 3. Each row represents a different set of parameters for discharge, exposure time, and pressure with photographic paper F1 in column 1, F3 in column 2, and F5 in column 3. Differences across rows should be due to the type of photographic paper used and chance variation.

In Figures 4 through 9, each row represents a set of parameters common across the row but different from row to row. One need only take a cursory look through Figures 4 through 9, row by row, to notice that differences exist among the auras even when the indicated parameters are kept constant. This is primarily due to random fluctuations in measurements and generally does not alter the import of the data. However, that such variations do exist should be kept in mind so that every aura with slightly different features is not given undue and mystical significance.

1. *Photographic Paper:* In each case, F5 photographic paper exhibits a rich aura with intricate detail, while F1 and F3 seem to produce detailed pictures only for the short exposure time of one second. Also, both F1 and F3 photographic papers favor a low-voltage discharge.

If one were interested in examining the broken veinlike image of the aura, one would choose a fast-developing film like F5. On the other hand, if one were interested in the width of auras, F1 and F3 could be used, especially with a high-energy discharge. It is well to note, however, that wider auras occur with longer exposure times for *any* type of film. Therefore, it would be possible to produce wide auras spuriously.

2. *Pressure:* The primary difference in the auras due to finger pressure seems to be in the size of the white contact area made by the finger pad. While some of the pictures seem to have a fuzzy circumference (Figures 7 and 8), and on some there is even a suggestion of the fingerprint, there doesn't seem to be a consistent pattern associated with only those auras made with light pressure. The fuzziness seems to be associated more with the 3-second exposure time on the F1 and F3 film.

3. *Voltage Discharge:* The higher-voltage discharge also tends to produce a darker and wider aura than the low-voltage discharge. Higher-voltage discharges produce more and brighter sparks per second. Therefore, we get blurring more quickly than for low-voltage discharges. Even with high-voltage discharge, the F5 photographic paper produces auras with quite distinct detail. However, the shorter exposure time produces the most vivid and intricate patterns.

4. *Exposure Time:* As was noted from Figures 3 and 4, the longer exposure time tends to produce a wider, darker aura due to the time-averaging of multiple sparks in the aura. The aura detail becomes blurred with increasing exposure time for the same reason an ordinary photograph becomes blurred

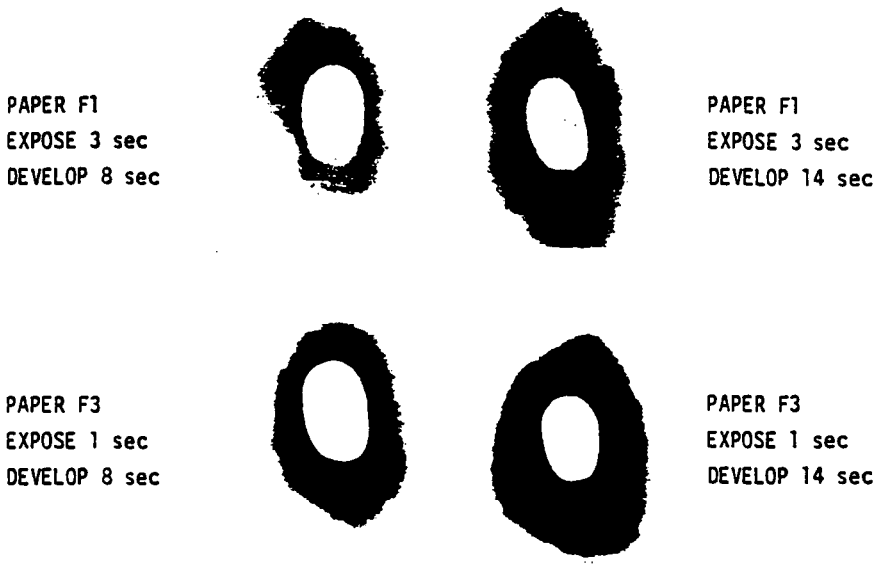


FIGURE 1a. The effect of change in length of photographic development time on the aura using light pressure and high-voltage discharge: (row 1) F1 photographic paper and 3-second exposure; (row 2) F3 photographic paper and 1-second exposure; (column 1) 8-second development time; (column 2) 14-second development time.

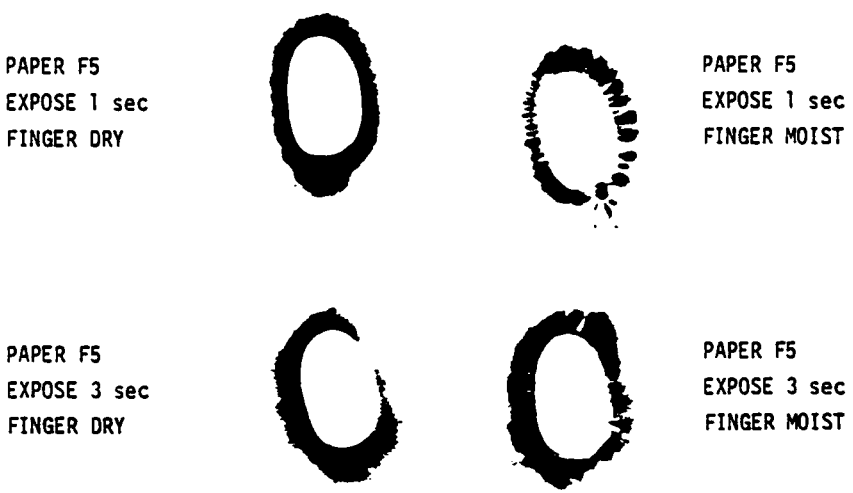


FIGURE 1b. The effect of change in moisture content on the aura using F5 photographic film, 1-second exposure time, high pressure and low-voltage discharge: (column 1) normal, dry fingers; (column 2) damp fingers.

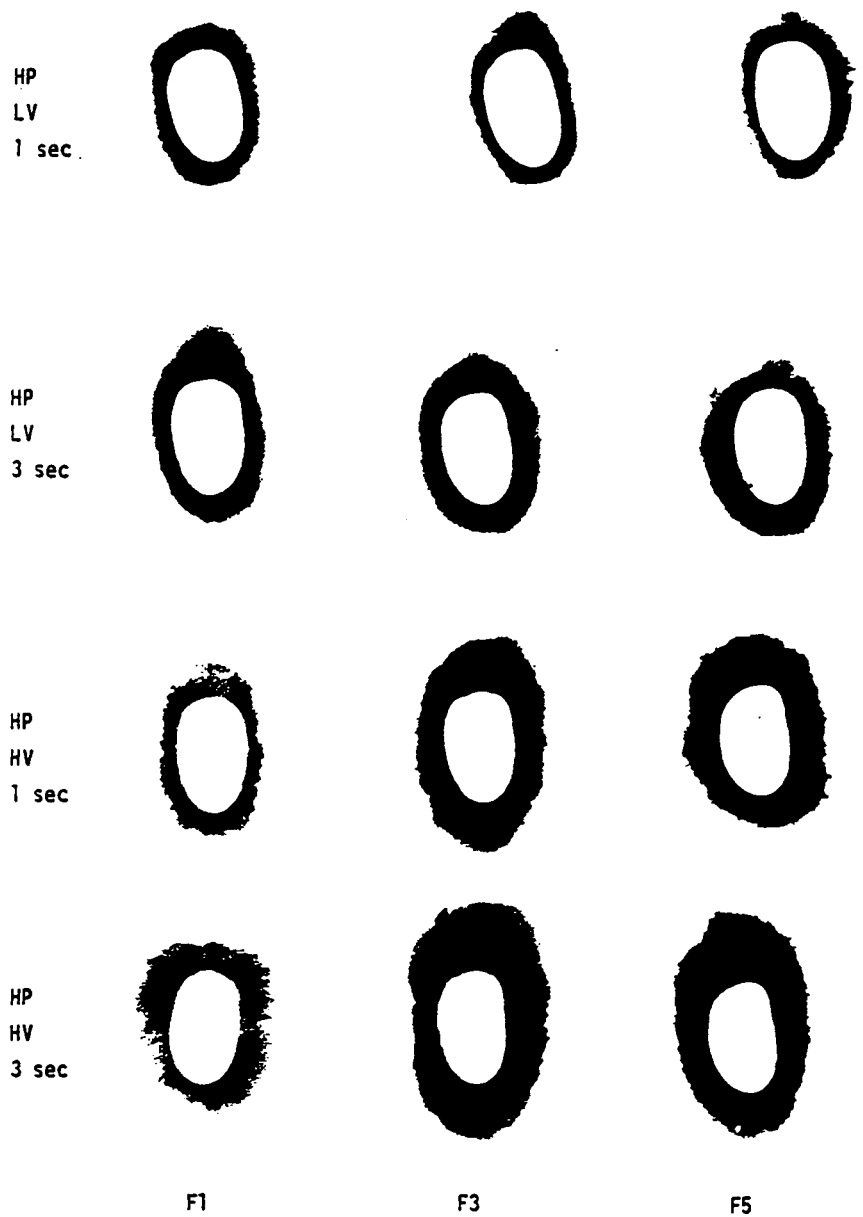


FIGURE 2. The effect of photographic paper type on the aura using heavy pressure: (row 1) low-voltage discharge and 1-second exposure; (row 2) low-voltage discharge and 3-second exposure; (row 3) high-voltage discharge and 1-second exposure; (row 4) high-voltage discharge and 3-second exposure; (column 1) F1 photographic paper; (column 2) F3 photographic paper; (column 3) F5 photographic paper.

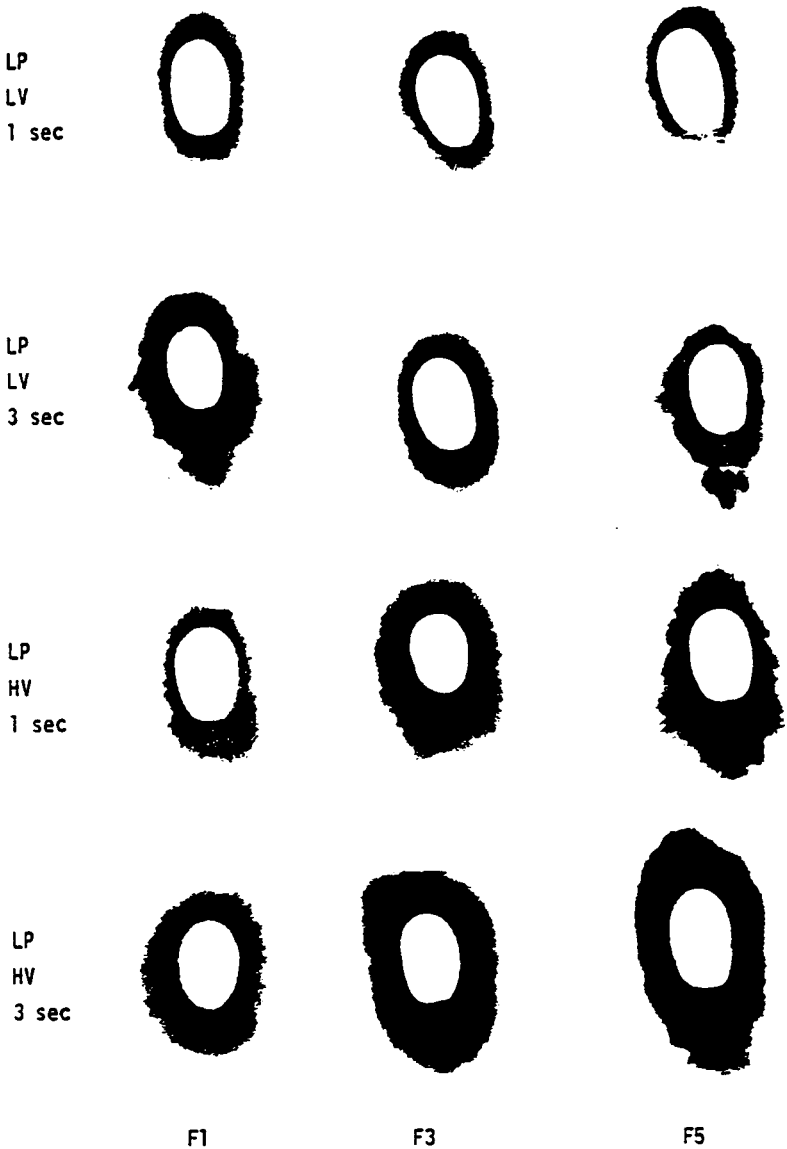


FIGURE 3. The effect of photographic paper type on the aura using light pressure: (row 1) low-voltage discharge and 1-second exposure; (row 2) low-voltage discharge and 3-second exposure; (row 3) high-voltage discharge and 1-second exposure; (row 4) high-voltage discharge and 3-second exposure; (column 1) F1 photographic paper; (column 2) F3 photographic paper; (column 3) F5 photographic paper.

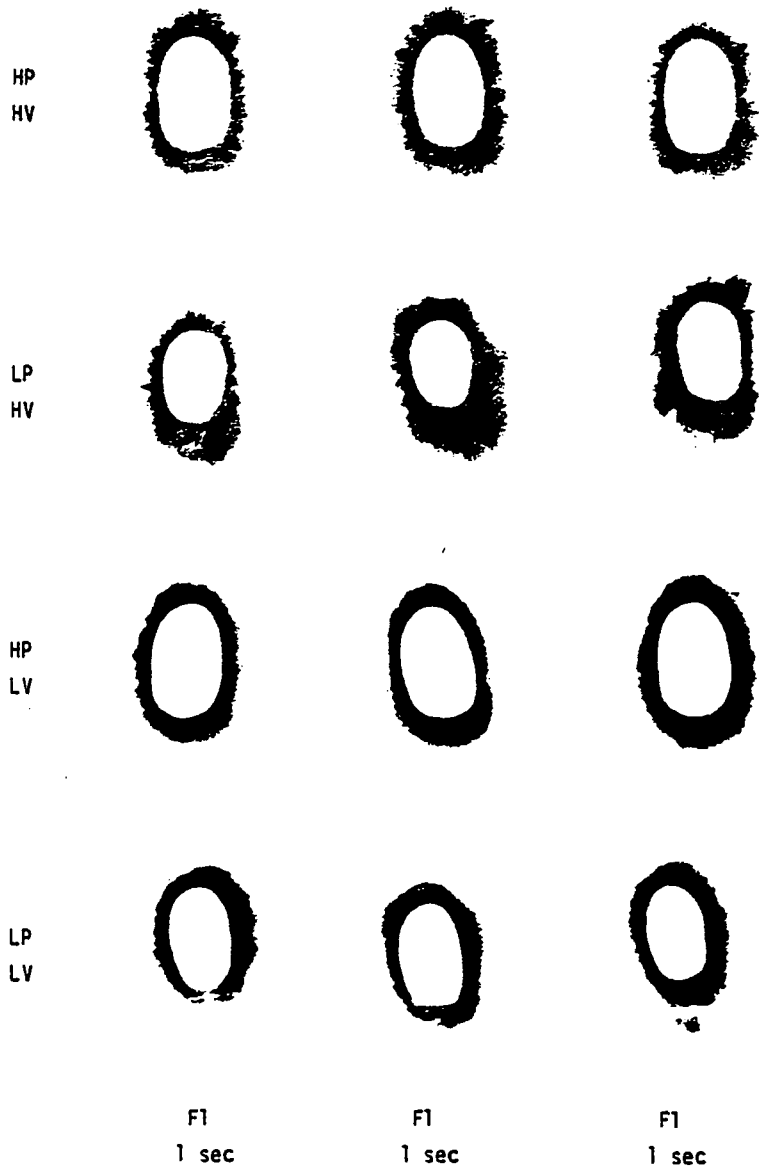


FIGURE 4. The effect of changes in the amount of voltage discharge and changes in pressure on the aura using F1 photographic paper and 1-second exposure: (row 1) high-voltage discharge and heavy pressure; (row 2) high-voltage discharge and light pressure; (row 3) low-voltage discharge and heavy pressure; (row 4) low-voltage discharge and light pressure.

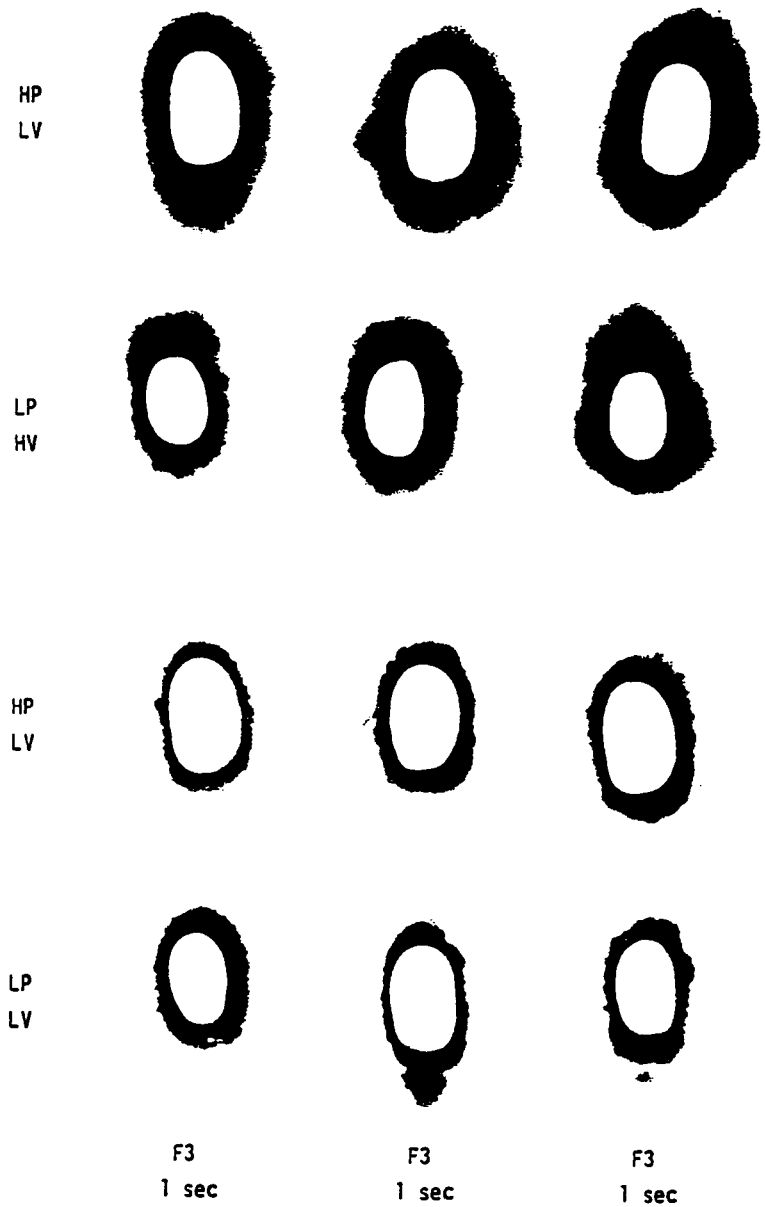


FIGURE 5. The effect of changes in the amount of voltage discharge and changes in pressure on the aura using F3 photographic paper and 1-second exposure: (row 1) high-voltage discharge and heavy pressure; (row 2) high-voltage discharge and light pressure; (row 3) low-voltage discharge and heavy pressure; (row 4) low-voltage discharge and light pressure.

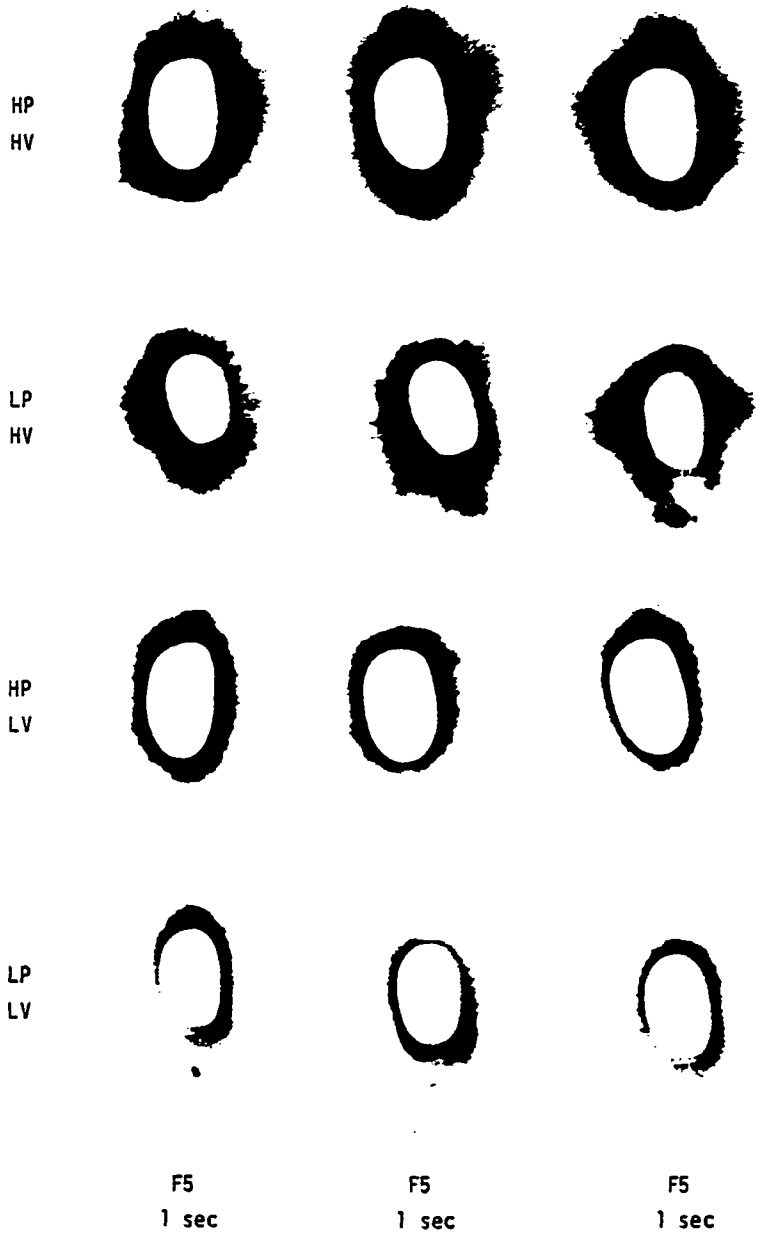


FIGURE 6. The effect of changes in the amount of voltage discharge and changes in pressure on the aura using F5 photographic paper and 1-second exposure: (row 1) high-voltage discharge and heavy pressure; (row 2) high-voltage discharge and light pressure; (row 3) low-voltage discharge and heavy pressure; (row 4) low-voltage discharge and light pressure.

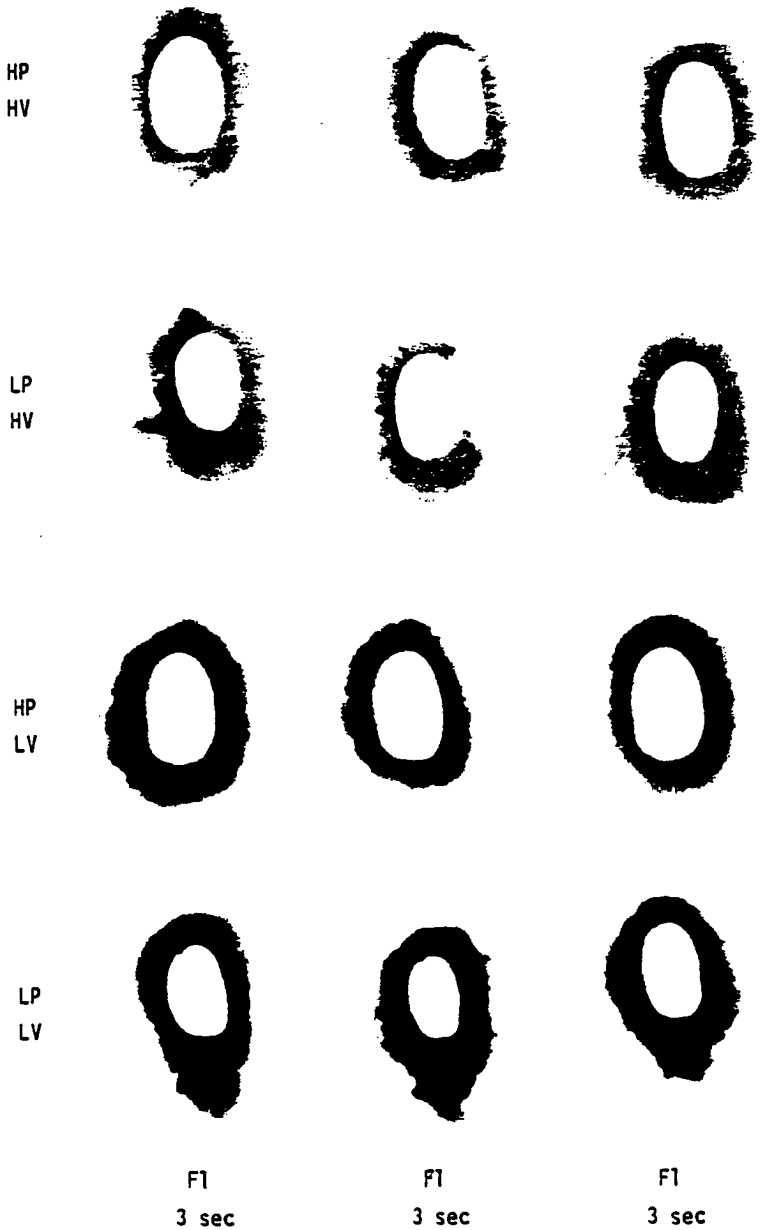


FIGURE 7. The effect of changes in the amount of voltage discharge and changes in pressure on the aura using F1 photographic paper and 3-second exposure: (row 1) high-voltage discharge and heavy pressure; (row 2) high-voltage discharge and light pressure; (row 3) low-voltage discharge and heavy pressure; (row 4) low-voltage discharge and light pressure.

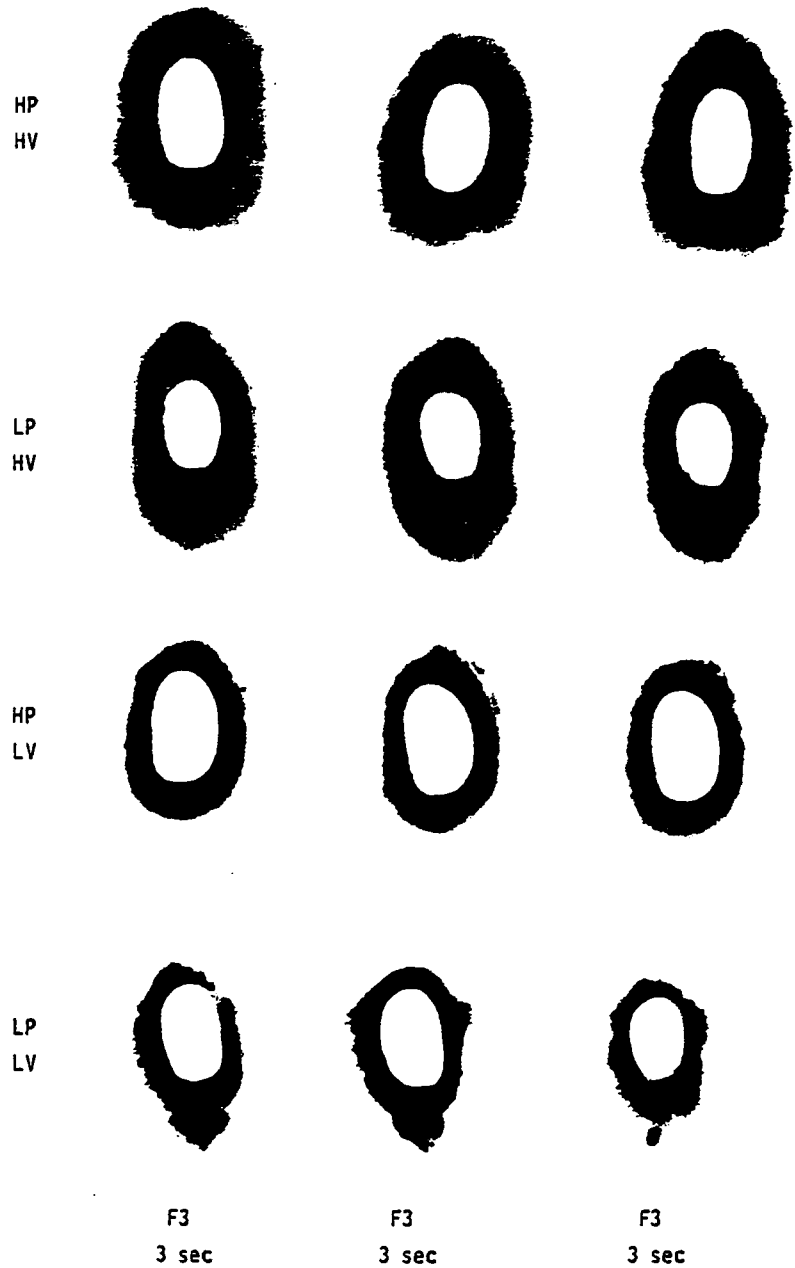


FIGURE 8. The effect of changes in the amount of voltage discharge and changes in pressure on the aura using F3 photographic paper and 3-second exposure: (row 1) high-voltage discharge and heavy pressure; (row 2) high-voltage discharge and light pressure; (row 3) low-voltage discharge and heavy pressure; (row 4) low-voltage discharge and light pressure.

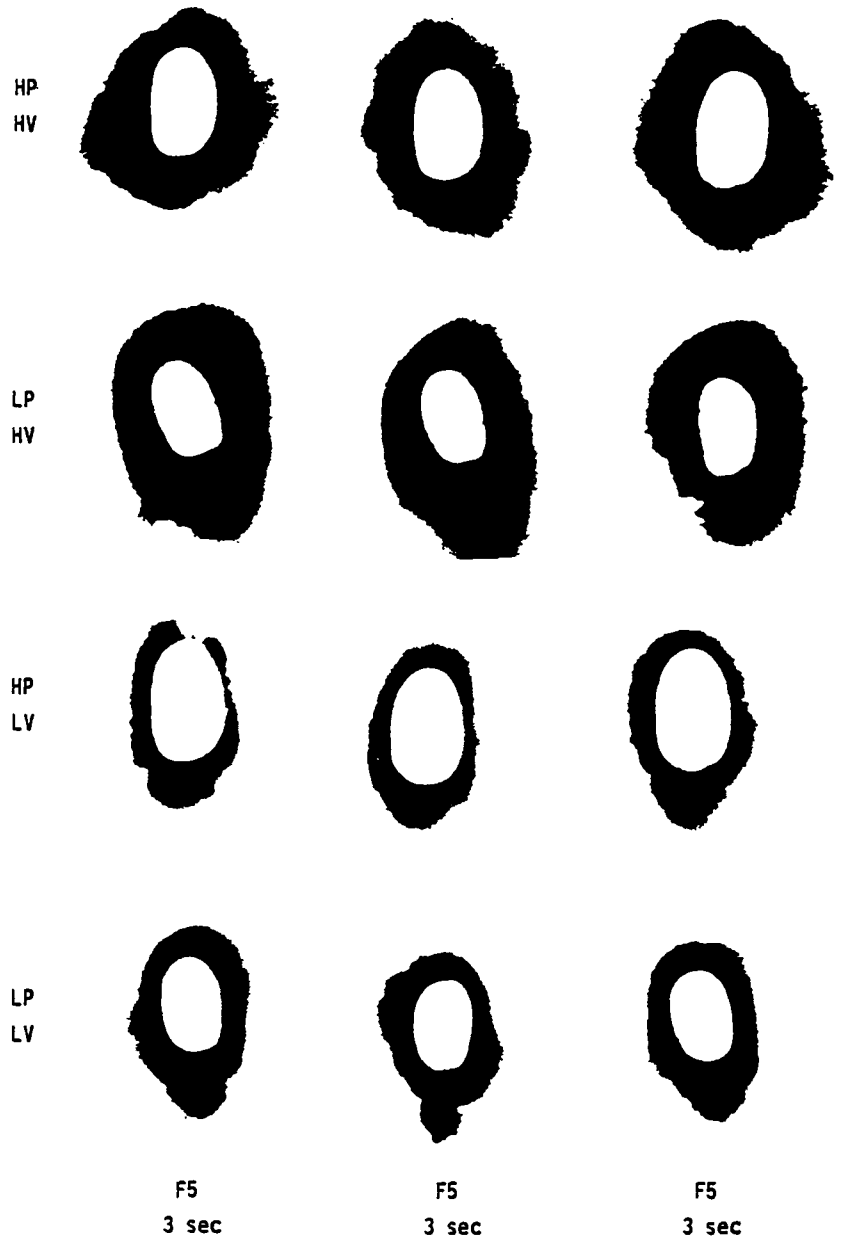


FIGURE 9. The effect of changes in the amount of voltage discharge and changes in pressure on the aura using F5 photographic paper and 3-second exposure: (row 1) high-voltage discharge and heavy pressure; (row 2) high-voltage discharge and light pressure; (row 3) low-voltage discharge and heavy pressure; (row 4) low-voltage discharge and light pressure.

by long exposure time. In addition, we found in Figures 7 and 8, as compared with Figures 4 and 5, that the longer discharge time tended to produce a less distinct boundary between the white pad of contact and the aura. This is also due to multiple exposures and possibly to slight finger motion during the longer discharge.

5. *Moisture in the Sample:* As can be seen in Figure 1b, moisture content causes sharp differentiations in the aura. The higher levels of moisture increase conductivity, producing a sharper aura. However, a quantitative measurement of moisture content of fingers is difficult and was not made here.

6. *Photographic Developing Time:* Whenever the development time is longer for any type of photographic paper, the width of the aura seems to be larger and the sharp differentiations tend to diminish. This is due to the multiple exposures discussed above, which are enhanced by a long development time.

Conclusions

It is very evident that every aura is different, but not every difference in auras has import. It should also be evident that without proper attention to the physical laws that we know exist and that affect the research it will be impossible to establish the value of Kirlian photography, especially as related to the psychological, physiological, and psychic nature of the individual. The time for speculation about the nature and import of Kirlian photography and about the deep complexities of man's psycho-physio essence will come only after every physical phenomenon has been examined and accounted for. Only then can differences be properly hypothesized to such influences as personality, emotional and mental state, and so on, and investigated at that level. Psychic-phenomena investigators have been and will continue to be viewed as wishful thinkers with a vested interest in their prejudices until they give proper respect to known natural laws. This is not say that their beliefs about the premise that the psychic state of an individual affects the aura are wrong. It is only to say it is too soon to say. Despite their years of research, because physical laws and their contributions to the aura have been ignored and adequate controls have been neglected, the possible contribution of Kirlian photography to the understanding of *Homo sapiens* is still an open question. Indeed, whatever value and truth Kirlian investigators may have wandered through have been lost to the world.

All is not lost, however. We feel Kirlian photography can contribute to those areas of science that can use a quick analysis of the two most important parameters affecting the aura: conductivity and the surface arrangement of the conducting areas. One area that comes to mind is geology, or mineralogy. A smooth, polished rock surface having granules of conducting and nonconducting material would give an aura pattern that would show the size and location of the boundaries. Cracks and fissures under the surface also might show up.

Bibliography

Aaronson, Steve. 1974. Pictures of an unknown aura. *The Sciences.* New York Academy of Sciences.

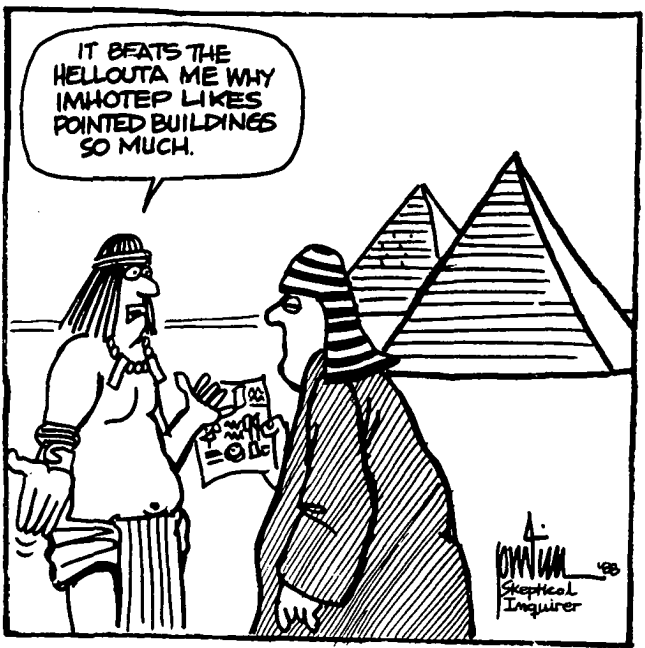
Krippner, Stanley, and Daniel Rubin. 1974. *The Kirlian Aura: Photographing the Galaxies of Life.* New York: Doubleday.

Gardner, Martin. 1957. *Fads and Fallacies in the Name of Science.* New York: Dover.

Moss, Thelma. 1975. *The Probability of the Impossible.* New York: New American Library.

Ostrander, Sheila, and Lynn Schroeder. 1970. *Psychic Discoveries Behind the Iron Curtain.* Englewood Cliffs, N.J.: Prentice-Hall.

Watkins, Arleen J., and William S. Bickel. 1986. A study of the Kirlian effect. SKEPTICAL INQUIRER, 10:244-257, Spring. •



THE MYSTERY OF THE PYRAMIDS

Certainty and Proof In Creationist Thought

The real strength of science lies in constant questioning of assumptions and beliefs. This, not certainty, should be emphasized in debates with creationists and others.

Joseph E. Laferriére

DEBATES BETWEEN creationists and evolutionists often appear to be conflicts between two equally unpersuadable and closed-minded groups. Creationists have been able to take advantage of this apparent dogmatism on the part of evolutionists to portray scientists as overly closed-minded and unwilling to listen to reason. Their opponents frequently inadvertently give support to this characterization by asserting that current evolutionary perspectives represent "proved facts of science." This idea that science "proves" things is a misconception held not only by creationists but also by large sectors of the general public as well, and it is even frequently aired by professional scientists.

I maintain that this air of certainty is ultimately harmful to the cause of true science, since the real strength of the scientific method lies in constant questioning of basic assumptions and beliefs. Nothing in science is ever known with absolute certainty. Scientific theories must always be on semi-probation, never being placed beyond the legitimate realm of further inquiry (Feibelman 1972). This, not certainty, should be emphasized in debates with creationists. The same general point applies to debates with other pseudoscientists.

Scientists propose theories that represent their best explanations of certain phenomena given the information currently at hand. The authors of these theories must be willing to revise or replace them if new evidence accumulates that refutes previous ideas. True, scientists are all too human, having egos (and grants) to nurture, and often find it difficult to abandon methods they have used for years and with which they have grown comfortable. Sometimes theories survive longer than they should. In the long run, however, the factual evidence remains the ultimate criterion for deciding scientific controversies

Joseph E. Laferriére is in the Department of Ecology and Evolutionary Biology, University of Arizona, Tucson, AZ 85721.

and must hold sway. Present-day biologists, for example, do not regard the *Origin of Species* as infallible and do not cite it to resolve disagreements among themselves; rather, they recognize that Darwin was right about some of his ideas and wrong about others. He was wrong not because he was stupid but because the information he needed to resolve certain problems was simply not available in his time. Herein lies the essence of the scientific method and the factor that has enabled science to progress so far and so quickly: the ability to adapt and grow with the acquisition of new knowledge.

This of course is not to say that any theory is just as good as any other or that scientists are fickle creatures willing to abandon their theories as suits the convenience of the day. As knowledge accumulates through the years and new methods for gathering data develop, scientists gain progressively more information on which to base their ideas; the theories therefore become more accurate reflections of the true forces and properties that guide nature.

Theories are useful primarily because of their ability to generate predictions (Kitcher 1982). Predictions must be tested by independent means; in other words, they cannot be evaluated using the same data used to generate the original theory. Then the argument would be circular. Experiments do more than simply generate data haphazardly; they are designed to gather the information needed to test predictions made by scientific theories (Feibelman 1972). The more success a theory has in generating predictions that turn out to be supported by fresh evidence, the more valuable the theory and the more support it is likely to engender in the scientific community (Kitcher 1982). If a theory proves incapable of generating predictions to explain certain phenomena, as Newtonian physics proved incapable of explaining certain minor perturbations in the orbit of Mercury, it must eventually be modified or replaced by a new theory, capable of offering satisfactory explanations.

Creationists have chosen to attack the theory of evolution by attempting to show it is incapable of explaining certain facets of nature (Morris 1974; Gish 1979; Wysong 1976; Wilder-Smith 1981; etc.). They offer creationism as the only possible alternative to the theory of evolution. In this attempt they fail miserably, since their arguments are notoriously flawed in both logic and factual support, as several excellent books persuasively attest (Kitcher 1982; Newell 1982; Futuyma 1983). The fact is, however, that they are not proposing any new ideas but are attempting to revive an old theory rejected by science more than one hundred years ago. They offer no new evidence to solve the problems that led scientists to question that theory in the first place, namely, the obvious resemblances between related species, the geographical distribution of various groups (e.g. why kangaroos are found only in Australia), and so on. Such problems with the creationist theory have significantly increased, not decreased, in the past hundred years because of advances in understanding the underlying similarity in cellular structure and biochemical processes common to all living organisms. The theory of evolution has proved to be remarkably effective at offering explanations of all

these phenomena. This is why the theory continues to be useful and accepted by most modern scientists.

The most fundamental problem in the creationist approach is not with the fine points of evolutionary theory that they have chosen as the battleground, but with the dogmatism of their adherence to their beliefs. The theory of special creation is, in the view of the creationists, infallible, since there is no new fact or idea that could possibly be discovered that could refute the theory. To quote Henry Morris, the acknowledged leader of the creationist movement, "There is not the slightest possibility that the *facts* of science can contradict the Bible and, therefore, there is no need to fear that a truly scientific comparison of any aspect of the two models of origins can ever yield a verdict in favor of evolution" (Morris 1974:15-16, emphasis in original). Keister (1976), another creationist, added: "Whenever theory and Scripture truly disagree, the theory must obviously be modified." Strickling (1979) even admits that creationists would be lost if they did not have the book of Genesis to guide them. Morris (1984) gives credit for the success of the Creation Research Society to its specific doctrinal commitment and constitutional prohibition against compromise.

Creationists' adherence to their theory takes precedence over factual evidence, as witnessed by Morris's (1974) insistence that the famous Miller-Urey experiment is irrelevant to the discussion because it does not prove what actually occurred during the early formation of the earth. He is of course correct in saying that it does not prove past events, but he misses the point; the experiment at least showed that, given the conditions believed to have existed on the primordial planet, the postulated series of events is at least plausible.

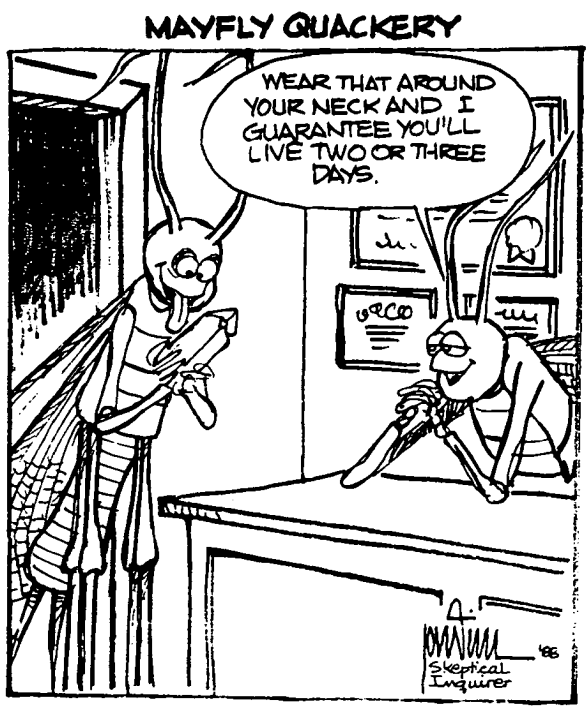
Creationists continue to profess their beliefs despite the inherent weaknesses in the theories, and they strenuously deny that any problems with the theory exist. The reasons for this fervent adherence stem from their moral and theological beliefs (Williams 1983; Kitcher 1982). The creationists themselves frequently assert religious and philosophical reasons for preferring creationism (e.g., Morris 1974). They feel that belief in the theory of evolution inevitably leads to immorality and a wide array of social problems.

The fact that they're wrong on this point is a question of crucial importance and one on which the creationists have not been sufficiently challenged. The adoption of creationist theories and their dogmatic methodology would negate many of the scientific advances of the past two centuries and stifle any further scientific and technological progress. To do so would be to condemn future generations to ignorance and halt the human race's struggle to improve its own existence. This is the ultimate moral question involved in the creation/evolution controversy.

References

Feibelman, James K. 1972. *Scientific Method: The Hypothetical-Experimental Laboratory Procedure of the Physical Sciences.* The Hague: Martinus Nijhoff.

Futuyma, Douglas J. 1983. *Science on Trial: The Case for Evolution.* New York: Pantheon.
Gish, Duane T. 1979. *Evolution? The Fossils Say No!* San Diego: Creation-Life Press.
Keister, J. C. 1976. A critique and modification of Velikovsky's catastrophic theory of the solar system. *Creation Science Research Quarterly,* 13(1):6-12.
Kitcher, Philip. 1982. *Abusing Science: The Case Against Creationism.* Cambridge, Mass. MIT Press.
Morris, Henry M. 1974. *Scientific Creationism* (General Edition). San Diego: Creation-Life Publishers.
———. 1984. *A History of Modern Creationism.* San Diego: Master Book Publishers.
Newell, Norman D. 1982. *Creation and Evolution: Myth or Reality?* New York: Columbia University Press.
Strickling, James E. 1979. Creation, evolution, and objectivity. *Creation Science Research Quarterly,* 16(2):98-100.
Wilder-Smith, A. E. 1981. *The Natural Sciences Know Nothing of Evolution.* San Diego: Creation Life Press.
Williams, Robert Charles. 1983. Scientific creationism: An exegesis for a religious doctrine. *American Anthropologist,* 85:92-101.
Wysong, R. L. 1976. *The Creation-Evolution Controversy.* Midland, Mich.: Inquiry Press. •

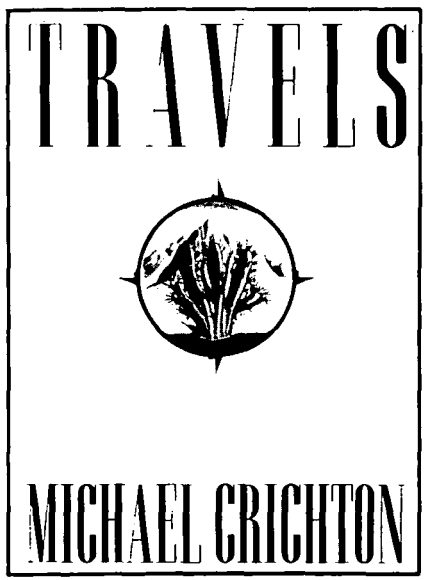


Book Reviews

New Age Wanderings

Travels. By Michael Crichton. Alfred A. Knopf, New York, 1988. 337 pp. Cloth, $17.95.

Barry Karr



IN A PURELY gut-level reaction, it would be quite easy for a skeptic to dismiss a large portion of Michael Crichton's *Travels* as the gee-whiz gushings of the latest Hollywood celebrity to fall head over heels into the New Age. To do so, however, would be a pity. Crichton, the author of such notable novels as *The Andromeda Strain* and *The Terminal Man,* and director of the films *Coma* and *The Great Train Robbery,* has something to offer.

Travels is basically a collection of little snippets of Crichton's life as he hopscotches his way across the globe in search of experience and adventure. Not merely content to measure his broadened horizons by the number of stamps in his passport, Crichton devotes a considerable amount of time and energy to delving into the mystical world of the paranormal.

While he is at his best when he writes of his sojourns in Borneo in search of headhunters, his meanderings through the Himalayas looking for Shangri-La, his scuba diving into shark-infested waters off Tahiti, his trek up Mount Kilimanjaro, and his encounters with giant gorillas and camp-crashing elephants in Africa, it is unfortunately his forays into the paranormal that will be most discussed and quite probably lambasted.

Let there be no mistake. Crichton does indeed fall head first into the New Age. But he does it with such determination and utter disregard for his self-professed skepticism that it is impossible not to find *Travels* an astonishingly (albeit not always

Barry Karr is public relations director of the Committee for the Scientific Investigation of Claims of the Paranormal and chairman of the Western New York Skeptics.

intentionally) humorous collection.

In an amusing introduction to the discussion of his adventure with the Spiritualist Association of Great Britain—while in London working on a film—Crichton writes: "Coming in the door, you passed the chair of Sir Arthur Conan Doyle, the association's most famous and influential member. . . . Anyone with a scientific background who becomes interested in metaphysical things must find the example of Sir Arthur Conan Doyle disturbing." Crichton then details Doyle's infatuation with all things paranormal and relates the story of Doyle's endorsement of the Cottingley Glen fake fairy photos of Elsie and Frances Wright. Crichton writes: "All his life he evinced a surprising willingness to accept all sorts of unlikely events."

Armed with his rational perspective on Conan Doyle, his scientific training (as a graduate of Harvard Medical School), and his knowledge of cold-reading techniques, Crichton nevertheless becomes convinced of psychic abilities after various members of the Spiritualist Association on a number of occasions come up with some amazing hits. Crichton becomes hooked on psychic readings and admits to visiting the association nearly every day during his stay in London.

In an insightful analysis of a psychic reading Crichton states: "I also noticed there seemed to be a groove or track they followed. They would be on the track for a while, and then they'd go off the track—abruptly becoming irrelevant or just plain wrong. Once they started to make incorrect statements, I learned that they might remain incorrect for a while, until they got back on the track." Crichton, though, seems to accept this as proof of psychic powers and remarks: "I was certain that some people . . . could tune into another source of information and could know things about people we didn't think were possible to know." He then vows to be "mindful of the reckless example of Conan Doyle," and not make the same mistakes.

Everyone who reads *Travels* will undoubtedly have his or her favorite chapter. My choice is the uproariously hilarious piece titled "Cactus Teachings," which opens a few years and a number of adventures after his visits to the London psychics. Crichton is attending a personal-growth, self-help seminar in the desert of California. He is told to walk in the desert until he finds a rock or a tree or a plant that seems to have a special relationship to him. This object will then be his teacher. Crichton laments the fact that he was continually drawn to a cactus that had the personality of "a grouchy old man." The cactus is at first quite reluctant to talk to him, and Crichton yells at it for being so uncooperative, then asks its forgiveness when he feels he has hurt its feelings. "No answer. Hardball from the cactus." Crichton goes on to state, "The fact that the cactus would attract me and then refuse to speak suggested that he might be a little hysterical." He then goes out into the desert and writes poetry and philosophy from the viewpoint of a cactus, draws designer cactus fashions and cactus comics, and pens a history of cactus religion and "The Sayings of Chairman Cactus"—both properly illustrated.

By the end of the seminar Crichton and his cactus are on relatively good terms. So much so in fact that when Crichton bids the cactus goodbye it tells him, "It's been good having you here with me." Crichton bursts into tears (as did I, from laughing).

In later chapters Crichton visits a medium who glows, becomes a trance-channeler, undergoes a past-life regression session (which he labels as a fantasy of his imagination), learns how to see auras, bends spoons, is exorcised of an "entity"—which looks like a Walt Disney cartoon devil—that has been attached to him since his childhood. (He is not convinced, however, that the entity really existed.)

Just when you begin to feel that you have Crichton properly labeled and safely

filed away he enumerates a list of things he believes in, things he doesn't believe in, and things on which he has no opinion. Included in the belief list are psychic phenomena like clairvoyance, precognition, and psychokinesis. Crichton also believes that there are powers of consciousness that have "legitimate dimensions not yet guessed at," and notes that the difference between a real entity and a metaphorical one may be slight indeed. And, finally, he believes that there are energies associated with the human body that are not yet understood. Crichton has seen these energies manifested through auras and chakras.

In the disbelief category he lists levitation, UFOs, the Bermuda Triangle, palmistry, numerology, astrology, psychic surgery, biorhythms, pyramid power, and others.

And in the "no opinion," or "lack of evidence," category we find past lives, entities, poltergeists, ghosts, the Yeti, the Loch Ness monster, and crystal power.

Summing up, Crichton comments: "You don't have to take my word about chakras or healing energy or auras. You can find out about them yourself if you want to. Don't take my word for it. Be as skeptical as you like." Sounds like good advice to me. Upon reflection, then, perhaps one can say that, yes, Crichton may have fallen into the New Age. But at least, as yet, he hasn't wandered totally "out on a limb." •

The Mailman Cometh

High Weirdness By Mail. By the Reverend Ivan Stang. Simon & Schuster, New York, 1988. 333 pp. Paper, $9.95.

Brian Siano

IT'S NO surprise to SKEPTICAL INQUIRER readers that there are an awful lot of offbeat, strange, and irrational beliefs in the United States. I've always looked at the wilder ones as a kind of Americana, but a part of our national character that we don't like to acknowledge. England may excel at producing lone eccentrics, but only in America does a kook or a visionary become part of our national fabric.

In the fall of 1986, the *Whole Earth Review* ran an article about "Cosmic Truth by Mail." (See *SI,* Winter 1986-87, p. 196, for a review of this issue.) The author, Ivan Stang (a cofounder of the parody cult "The Church of the Subgenius") explained that his hobby was collecting mail from strange organizations. He would simply write to groups that looked promising, asking for information, and he would receive amusing replies. These replies ranged from information sheets and catalogs to "several thick volumes of priceless *bulldada* (a collector's term meaning 'that which is great because it doesn't know how bad it is')." Stang also listed several good sources for such mail, with the funniest commentary I've read in a long time.

On the basis of Stang's list, I became a collector myself, adding my own sources

Brian Siano is a freelance writer and researcher in Philadelphia and one of the organizers of the Delaware Valley Skeptics.

to the list and enjoying almost every minute of it. It is a truly amazing process: A single letter asking for information might pull in an inch-thick stack of tracts explaining (*a*) the Space Brothers' plans for our spiritual advancement, (*b*) the Jewish-Masonic-Catholic conspiracy to ruin America, (*c*) the imminent return of Jesus Christ, or (*d*) all of the above. As an all-around cynic with a ghoulish sense of humor (I also joined the Church of the Subgenius around this time), I was in transports—the *finest* in bizarreness, and delivered to my house practically for free!

Stang has recently published his Bulldadabase in a book, *High Weirdness By Mail,* and it's packed with more than 330 pages of "the uncut *real thing*—straight from the authentic diseased minds of transcendent visionaries and compulsive would-be saviors driven to communicate their *crucial discoveries* to a *smirking* world."

The book is divided into rough categories: "Weird Science," "UFO Contactees," "Jesus Contactees," all colors of the fringe political spectrum, "New Age Saps," and "Groups You Love to Hate (but they hate *you* even more!)." Stang also lists sources for creativity outside the mainstream as well—the growing tape-cassette marketplace, underground comics, Japanese animation, science-fiction fandom, fanzines for *every*-thing, and joke organizations. (The latter includes the Church of Beaver Cleaver and the Association to Save Madonna from Nuclear War.) In no way is the book complete—groups come and go quickly on the fringe, so no list can include everything—but Stang provides a fairly comprehensive menu. And yes, the SKEPTICAL INQUIRER comes in for a light drubbing and a high recommendation.

Stang's listings push sarcasm to new limits of hilarity. At times I wondered how he managed to avoid fears of libel on the part of his publisher. But, as he puts it, "Iron-hided cynicism was clearly the only practical point of view from which to approach materials that represent their makers' most cherished beliefs. To grossly insult almost everyone listed is the only way to be *fair*. . . . True, I'm raking them over the coals, but I'm also putting their addresses in front of thousands of people." On the whole, the tone of the book is more jaded than vindictive. Stang has simply seen so *much* of the stuff that he can't help but joke about it.

For example, here is part of his description of Rational Culture, a gigantic UFO cult in Brazil:

> The translations from Portuguese into English are so badly done as to severely amplify the already psychotic tone. "Our world is a bird that fabricates other birds, that we are and that here we are in passing." See? The cosmic alien authors . . . offer a history of the universe where we didn't evolve from monkeys, but from ash-monsters formed by primordial "resin." "The primitive bodies were little monsters and afterwards monsters. Then monsters, after big monsters and after huge monsters. . . . They screamed-utter, made gestures to understand each other." This may sound really stupid to you, but in size this group is gaining on the Mormons.

Or this description of a group called Free Love Ministries:

> These patriots don't mince words. . . . Okay, sure, they *are* dangerous, hopelessly ignorant, inbred, retarded borderline lunatics with an insatiable lust for the blood of sinners—but at least they're *honest* about it. . . .

And, for a last taste, here's Stang on Eckankar, which he titles, "The Ultimate 'Duh.' "

> The Stupidest Cult. A coloring-book occult/oriental philosophy in which daydreaming and wishful thinking become "the ancient science of soul travel." Learn to protect your astral body *while driving*!!

I cannot recommend this book highly enough, on entertainment value alone. The added bonus is that Stang and his co-conspirators have given us a vivid picture of the range of bizarre and eccentric beliefs in this country. And through every listing (try reading them aloud) is the love Stang has for his sources. For all our efforts to fight irrationalism, it will probably always be around. And there's something truly alive in a lot of it; as much as I detest charlatans and con artists, the crackpots out there are usually wild, and I can't help but admire the energy they put into their projects. Or, as Stang himself puts it:

> Unlike the mainstream newsstand magazine publishers . . . hardly any of these little publishers and ranters are in it for the money. They are compelled by a desire to share. (Forget for a second that you don't really *want* what they're begging you to take.) Despite all the compulsions, delusions, bitterness, and fanaticism that mark so many fringe cause groups, the drive to share gives the worst of them a measure of dignity that the popular slick publishers can't seem to comprehend. They may be wrong, insane, simple-minded, or whatever, but, with only a few exceptions, they mean what they say. They're sincere. In that respect, these kooks and weirdos possess truer humanity—faults and follies notwithstanding—than do many of those who gave them that label. Or, I should say, who gave *us* that label. . . . I *love* the kooks and weirdos. •

Ararat and the Ark

The Lost Ship of Noah. By Charles Berlitz. Fawcett Books, New York. 192 pp. Paper, $3.95.

Al Martin

THE COVER of *The Lost Ship of Noah* promises to "fascinate and charm" its readers and raises expectations that they will discover within its pages "the startling find at Mt. Ararat." For, after decades of organized searching in quest of the biblical Ark of Noah, author Charles Berlitz (inventor of the "Bermuda Triangle," Atlantis explorer, and prophet of "Doomsday 1999 A.D.") "is convinced that definitive proof of the Ark now exists."

However, the text of this decidedly unfascinating book totally fails to produce any "startling find," any proof, or even any convincing evidence whatsoever that the Ark ever actually existed. Much of the argumentation is, in fact, a retelling of the stories of Violet Cummings, Tim LaHaye, John and Henry Morris, and other crea-

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Al Martin is associate professor of biology at Illinois Benedictine College. He is the science adviser for the Midwest Committee for Rational Inquiry and liaison of the Northern Illinois Committee of Correspondence.

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tionist "Arkeologists," whose books constitute major references in the text. The sum total of Berlitz's evidence for the existence of the Ark falls into two categories: reported sightings of its remains and "evidence" that the Flood is a historical fact.

Berlitz does a good job of summarizing the reported sightings of the Ark from medieval times to the present and of describing the finds of major expeditions that have been dispatched to Ararat in recent years by various (mostly creationist) organizations. Fully half the text is devoted to this task, and anyone who wishes to read a short review of the history of Ark-hunting may find this book quite useful. However, none of the reported sightings are, of themselves, satisfactory proof of the Ark's existence, and Berlitz, in occasional moments of surprising candor, admits this. He acknowledges, for instance, that Ark-hunters are "mainly religiously motivated" and that "lack of definitive proof of the Ark's existence has had little effect on the millions who believe in its actuality." He points out that the best photographs of the Ark are "either lost or inconclusive" and that "almost any unusual feature of the mountain is likely to be associated with the Ark by observers from the air, the plain, or the nearby hills." "These observers," he writes, "even if they do not realize it, are psychologically conditioned to believe in its reality." No "startling finds" or anything resembling definitive proof is to be found anywhere in the book. Rather, Berlitz's illogical reasoning seems to be that the reported sightings of the Ark constitute something of a critical mass: If so many apparently sincere people claim to have seen a boat atop the mountain, then there must be *something* there after all. And that something is quite possibly Noah's Ark. In this, Berlitz agrees with pilot and Ark-sighter Colonel Ben Bowthorp, who said, "Most of us felt it could be the Ark since that's where it's supposed to be." Or, as veteran Ark-hunter Fernand Navarra said, "What else could it be?"

In his reporting of the details of the individual sightings, Berlitz does, in fact, inadvertently make a good case for the insufficiency of the evidence of eyewitness accounts, since many of the details of different sightings are contradictory. For instance, the Ark has been sitting on a frozen lake in a valley surrounded by small peaks that prevent it from slipping (Roskovitsky) or, is perched precariously on a ledge (Greene). It has also been reported to be buried under a glacier, which required a perilous descent into a crevice to reach (Navarra), or largely exposed and easily accessible (Hagopian, Resit, and Green). Explorers who have found wood allegedly from the Ark have found it to be so hard that "even musket fire hardly dents it" (Hagopian) or soft enough to cut into pieces (Navarra). The Ark also appears to have been discovered at several different elevations on the mountain. On one of his expeditions, Fernand Navarra, an experienced mountain climber, became dizzy and ill at around 15,000 feet, near a glacier where he reported seeing the Ark buried under the ice. Yet, George Hagopian—who as a child climbed atop the Ark and kissed it—was carried to it on his uncle's shoulders, implying a relatively low elevation. Clearly, rather than substantiating one another, these eyewitness accounts force one to conclude that either there are many Arks on Mt. Ararat or that the accounts are simply unreliable and wish-fulfilling. In fact, what the witnesses have seen are most probably rock formations or dwellings or artifacts left by medieval monks who once resided on Mt. Ararat. Those who believe Ararat to be the resting place of a literal Ark, and who go expecting to find it, *will* find it, whether or not it actually exists.

The second half of the book is not nearly as well written as the first. The arguments and reasoning Berlitz uses would look familiar to anyone who has read

much of the creationist literature. In his attempt to convince the reader of the historicity of a worldwide flood, Berlitz relies on a few selected scientific facts taken out of their proper geological context, and on religious traditions, without adequately exploring either. He points out, for instance, that seashells and pillow lava have been found on Mt. Ararat and that herrings similar to marine forms are found in a certain Turkish lake. His implication is that they must have been carried there by a very large flood, but he makes no mention whatsoever of such widely substantiated geological processes as plate tectonics and orogeny, by which geologists explain such phenomena in purely physical terms. He drives home the fact that Sir Leonard Woolley discovered ancient flood deposits during excavation of the city of Ur, but fails to mention that excavation of Jericho and other ancient sites has revealed no similar deposits. But Berlitz's main line of "evidence" for a worldwide flood is the abundance of flood stories in the traditions and cultures of many diverse populations. He apparently fails to recognize that there are many cultures that *do not* have flood legends in their mythologies and that most flood legends have virtually nothing in common, except for the flood itself, which strongly implies they are not describing the same event or at least renders this line of "evidence" useless.

The author's research for the book was apparently a selective search for evidence that he thought would support the existence of the Ark. It is obvious that he has studied the "definitive" creationist books on the search for Noah's Ark (although he makes a great effort *not* to associate himself with the "creation science" movement). He has traveled to Mt. Ararat in Eastern Turkey and has even interviewed some of those individuals who claim to have seen the Ark. But when I appeared on radio with him to discuss his book, he seemed to have given little thought to the technical problems that render the entire concept of Noah's Ark physically impossible—or else he had decided to play down these problems. These include the fact that an overburdened wooden ship 300 to 400 feet long would probably sink in even fairly calm waters, much less withstand the unprecedented hydrologic forces of worldwide deluge. How were the animals found, gathered, boarded (in a single day), and cared for? How did elephants, tree sloths, and kangaroos climb down off Mt. Ararat (which explorers have characterized as "perilous") and migrate to their present homes across deserts and oceans? Apparently anticipating such questions in the mind of the reader, Berlitz offers only a few brief and unenthusiastic answers. How were all those animals fed? "They went into a state of hibernation and did not need food," says Berlitz. (This is unbiblical as well as physically impossible.) He brushes aside these fatal problems, simply claiming that everything becomes "logical when accompanied by faith."

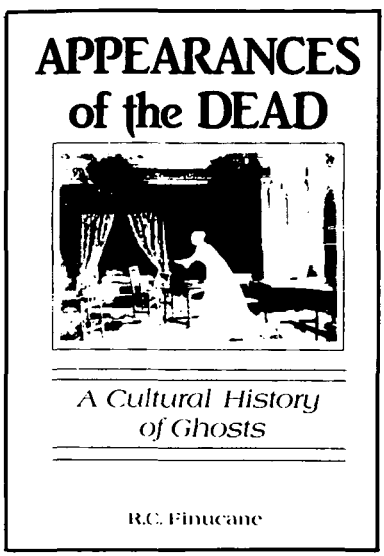
In the final analysis, the existence of Noah's Ark, like the UFO-abduction stories, is founded upon (at best) circumstantial evidence and numerous eyewitness testimonials but has not one shred of reliable physical evidence to support it. And *The Lost Ship of Noah* provides us with nothing new or convincing. •

A History of Hauntings

Appearances of the Dead: A Cultural History of Ghosts. By R. C. Finucane. Prometheus Books, Buffalo, N.Y. 232 pp. Cloth, $20.95.

Erik Strommen

GHOSTS HAVE a compelling air of antiquity about them. Images of restless souls rising from their graves, or lingering near the places they frequented in life, suggest something timeless and eternal about the human spirit. That ghosts should stir a feeling of eternity is not surprising. As the children of imagination and the human fear of death, ghosts sit astride one of humankind's greatest anxieties. As denizens of the "other world," ghosts can therefore teach us much, not about the afterlife, but about ourselves. This is the basic theme of *Appearances of the Dead: A Cultural History of Ghosts.*



R. C. Finucane, a historian, has done a great service by conducting a long overdue intellectual history of ideas about the spirits of the dead and their haunting of the living. His thesis, articulate and well argued, is that ghosts reflect the collective cultural view of death of their times and that as our ideas of death have changed, so have our ghosts. To illustrate his point, we are given a tour that starts in ancient Greece, where dead souls were relatively harmless, and "flitted and squeaked like crazed bats all the way down to Hades," goes through the Middle Ages, where ghosts were potentially malevolent bringers of moral authority and vengeance, and ends up in the modern world, where ghosts have become little more than sporadic, idiosyncratic visitations, seemingly meaningless in their activities and appearances. Along the way, we are treated to authoritative commentary on ghosts by contemporary scholars, and we get to meet the restless dead themselves, in all their wonderful forms.

Finucane's thesis is presented on two levels, which are interwoven throughout each chapter. At the formal level, he provides us with a sample of theological and "scientific" views of the authorities of each period we visit, informing us of their assumptions and debates. At the experiential level, we are introduced to the spirits themselves, their stories recounted in the words of their percipients. I'll discuss these two levels separately, beginning with the authorities and the formal theories of ghosts that have been argued through the ages.

Through an analysis of classical works, medieval church texts, and intellectual

Erik Strommen is a doctoral candidate and lecturer in the Department of Psychology, Rutgers University, New Brunswick, NJ 08901.

treatises, Finucane shows us how ghosts entered Christianity as artifacts of paganism. Invited in by Catholicism's preoccupation with the burial sites of saints and its desire to gain converts through the accommodation of alien beliefs, ghosts presented a sticky issue for the Church. Their "existence," at first denied, was taken eventually as evidence against immediate judgment and consignment to heaven or hell upon death; ghosts in fact served as a significant factor in the formation of the doctrine of Purgatory. Although some clerics questioned their existence, ghosts were eventually welcomed into Catholic theology with open arms. Hauntings fit neatly into the Catholic cosmology, in which death and life were closely connected, and where actions taken in this world had direct implications for one's fate in the next. Finucane shows us churchmen using tales of hauntings as moral lessons; and ghosts in the Middle Ages came to be heavily imbued with symbolic meanings, often depicted as wearing clothing or bearing burdens relating to sin and its punishment.

The comfortable place of ghosts in the Christian afterlife gradually eroded, however. The Protestant Reformation created the first real problems for the wandering dead. Protestantism rejected Purgatory and the idea that souls were not immediately judged and sent to one afterlife or another. The existence of ghosts, then, had to be explained by other means. After all, ghosts were *real.* The solution? Ghosts were argued to be not the souls of the dead but actually other supernatural creatures (most often devils) in disguise! This difference of opinion between Catholicism and its reformers generated much earnest (and often ridiculous) debate over criteria for distinguishing ghosts that were human souls from those that were demonic in origin. This controversy, which Finucane gleefully replays for us, served only to give ghosts an increasingly ambiguous ontological status, dislocating them from the comfortable position they enjoyed in Catholicism's orderly universe. This section of the book, potentially long-winded and tedious, is kept fresh by the author's dry wit, which serves as a pleasant contrast to the often heavy-handed arguments he documents for us.

The best sections of this part of the book, however, come with the Enlightenment and the nineteenth-century period. As reason and critical thought were brought to bear on ghosts and other supernatural phenomena, many of the absurd features of spiritual visitation became the subject of devastating scrutiny. Witness, for example, the delightful controversy over the substance of ghostly clothing. For centuries, clerical prudery and public mores had kept ghosts decently covered in a wide variety of garments. Yet if ghosts were the souls of the dead, were their clothes also the spirits of their garments? Or were they made of a mystical substance? And who created this substance, and for what purpose? God? The Devil? Finucane documents how ghosts occupied a central place in the anti-religious arguments of the time, and became the butt of some extremely funny, often acid commentary by proponents of reason and free thinking. In this hostile environment, it is not surprising that the nineteenth century witnessed the decline of ghosts as both moral authorities and features of theological debate. The almost obsessive interest in ghosts during the Victorian era, which Finucane argues was due in part to the dreadful mortality rates in the new urban slums, was blamed by contemporaries on the loss of faith by the population. Whatever the reason for Victorian spiritualism, it is notable that since the 1890s our ghosts have not changed. Ghosts have become little more than random symbols of a belief in an immortal soul, but a soul without a cosmology or a place to belong.

While Finucane's review of the history of ghosts is informative, the best part of

this book really is the experiential level, the ghosts themselves. Finucane illustrates his thesis that ghosts are reflections of our cultural beliefs by showing us how the relationship between ghosts and their percipients has changed with time. In the closely knit social world of the Middle Ages, for example, you *knew* your ghost. Medieval ghosts haunted their relatives and friends, exhorting them to pay old debts, correct old wrongs, and avenge family insults. Medieval ghosts also had a gift for gab. They cajoled, threatened, beseeched, and harangued; some talked so much it seems they were actually lecturing their percipients rather than haunting them. With the Reformation debate over the origins of ghosts, we watch them change, becoming increasingly ambiguous and malevolent, reflecting the new perception of their possible demonic nature. As the years pass ghosts say less, and their behavior becomes more unusual and incomprehensible. By the nineteenth century, ghosts had become anonymous strangers, unintelligible in their actions and appearances. Their identities were and are now unknown to their percipients, a situation in striking contrast to the homey familiarity of medieval hauntings.

Finucane draws heavily on the casebooks of the British Society for Psychical Research (SPR) for his insights into Victorian ghosts, and his most interesting observations come from a close reading of the notes of the SPR investigators themselves, some of whom voiced doubts about the reality of many ghost sightings. As for the modern day, Finucane finds that twentieth-century ghosts are no different from their Victorian counterparts. Instead of confronting their percipients, speaking to them of death and morality, modern ghosts are almost always mute. They rush down hallways, disappear into walls, or are simply sounds, vapors, or sensations. With the decline of a common world-view, our connection to the next world has lost all coherence, but our desire for immortality remains. Now it is reduced from the visitations of relatives with a vested interest in the percipient to superficial, fleeting images of long-dead strangers.

Ultimately, I felt oddly nostalgic as I reached the end of this book. Dr. Finucane takes the ghost's point of view in presenting his accounts, and I felt a certain sadness and sense of humiliation as ghosts lost their dignity and sank into the province of spiritualists, side-show hucksters, and frauds. Finucane argues that ghosts are projections of the human need for assurance of immortality, of something beyond death. He clearly documents how ghosts serve this function, and how, as our views of the afterlife have become more and more diffuse, our ghosts have degenerated. In the context of his review, Finucane does a nice job of highlighting the many prosaic reasons for ghost sightings, ranging from the unbalanced mind (noted as a source of ghostly sightings since the Middle Ages) to attention-getting, social reinforcement, and plain old deceit and manipulation. None of these sources are developed in detail, but that is not the purpose of this text. This book is also chock full of terrific ghostly trivia. In its pages, many historic figures, from St. Augustine to Sir Christopher Wren, get their say about ghosts. We are also treated to the strange practices of our ancestors, such as cutting up the bodies of saints to make multiple shrines and admitting ghostly statements as evidence in court.

Personally, I would have liked to have known a little about European pagan beliefs in ghosts and hauntings, especially since New Age channelers often claim these sources as inspiration, but that is a small regret given the rich amount of material covered in *Appearances of the Dead.* I enjoyed this book immensely; it gives a good feel for the intellectual and cultural roots of ghosts and why they will continue to haunt us, not just in the present day, but most likely far into the future. •

Some Recent Books

A listing here does not preclude a detailed review in a future issue.

Bauer, Henry H. *The Enigma of Loch Ness.* University of Illinois Press, 54 E. Gregory Dr., Champaign, IL 61820, 1988. 243 pp., $9.95, paper. New paperback edition of book published in hardcover in 1986. An examination of the Loch Ness controversy and why it has persisted.

McIver, Tom. *Anti-Evolution: An Annotated Bibliography.* McFarland & Co., Box 611, Jefferson, NC 28640, 1988. 420 pp., $39.95, cloth. Lengthy nonpolemical annotations of 1,850 books, pamphlets, and tracts summarizing content and identifying doctrines and theories.

Nickell, Joe, with John F. Fischer. *Secrets of the Supernatural: Investigating the World's Occult Mysteries.* Prometheus Books, Buffalo, N.Y., 1988. 199 pp., $18.95, cloth. An investigative casebook of careful, clear analyses of specific instances of reputedly preternatural phenomena. Subjects scrutinized include haunted stairs, the Crystal Skull, phantom pictures, incredible disappearances, sychronicities, "witching" for hidden gold, the image of Guadalupe, bleeding doors, the Barbados Vault mystery, and spontaneous human combustion.

Rothman, Milton A. *A Physicist's Guide to Skepticism.* Prometheus Books, Buffalo, N.Y., 1988. 247 pp. $19.95, cloth. A guide for the layman to what is possible and what is impossible, drawing upon knowledge of the most fundamental principles of physics. Applies laws of physics to such topics as UFOs, poltergeists, ESP, anti-gravity, faster-than-light travel, time travel, perpetual motion, and the creation-evolution controversy.

Stenger, Victor J. *Not By Design: The Origin of the Universe.* Prometheus Books, Buffalo, N.Y., 1988. 202 pp., $22.95, cloth. Author illustrates how order can and does emerge from chaos every day—by accident. Draws upon modern research in physics and astronomy to contend that the universe came about by means of a complicated and arbitrary sequence of events during the first tiny fraction of a second of the Big Bang.

Sullivan-Fowler, Micacla, Terry Austin, and Arthur W. Hafner. *Alternative Therapies, Unproven Methods, and Health Fraud.* American Medical Association, P.O. Box 10946, Chicago, IL 60610, 1988. 47 pp., $20, paper. Selected annotated bibliography of clinical and lay columns, newspaper articles, medical statements, and books to help individuals make educated decisions on health care.

—Kendrick Frazier

Articles of Note

Alexander, David. "A Closer Look at Today's Faith Healers." *The Humanist,* September/October 1988, pp. 8-12. A critical look at faith healers' claims, their fund-raising methods, and their financial accountability.

Ansley, David. "Making a Monkey of Evolution: Science Texts Mislead Kids, Critics Complain." *San Jose Mercury News,* June 21, 1988, p. El. Critical report on biology textbooks that are "boring, dumb, and wrong" in refusing to present such fundamental concepts as evolution. With sidebar "A Theory Is Not Just a Guess."

Barnhart, Joe. "Faith Healers in a Naturalistic Context." *The Humanist,* September/October 1988, pp. 5-7. A look at why faith healers are able to prey upon people's trust and fears.

Benetta, William J. "The Rise and Fall of the Louisiana Creationism Law. Part 1: A Bold Trick." *Terra* (Natural History Museum of Los Angeles County, 900 Exposition Blvd., Los Angeles, CA 90007, $2.50 per back issue), 26(6):20-27, July/August 1988. Part 2 appears in September/October issue. A detailed retrospective on the efforts of creationists, through now struck-down legislation, to "impose onto the population at large, by political means" their particular fundamentalist religious beliefs.

Beutler, Jaap J., et al. "Paranormal Healing and Hypertension." *British Medical Journal,* 296:1491-1494, May 28, 1988. Report on a randomized trial to see whether paranormal healing by laying on of hands, paranormal treatment at a distance, or no treatment at all, might reduce blood pressure. Found that none of these methods was consistently better than the other. "The data cannot therefore be taken as evidence of a paranormal effect on blood pressure."

Davidson, Keay, and Janet L. Hopson. "Gorilla Business." *Image (San Francisco Examiner* weekly magazine section), April 10, 1988, pp. 14-36. Major investigative article by two science reporters into the "research" and claims surrounding Koko the talking ape. "Koko is a bona fide celebrity, attracting legions of fans and over a million dollars in donations. Are supporters getting solid science for their money?" they ask. The consensus of numerous animal researchers the reporters contacted for an assessment of Penny Patterson's work is that overinterpretation of data and subtle cueing of the animal still plague the efforts and that the picture is clouded further by underreporting in the scientific literature. These negatives offset much of the good accomplished by the greater sensitivity toward apes Patterson's publicity engenders.

Donnelly, Steve. "Belief in the Paranormal Explained." *New Scientist,* June 23, 1988, p. 73. Amusing column speculates on reasons for popularity of pseudoscientific belief and decides it's due to radionic metaphysical energies beamed down by "Cosmic Masters," who are "potentializing our belief in the paranormal 3,000 times!"

Dusek, Val. "Bewitching Science." *Science for the People* (847 Main St., Cambridge, MA 02139), November/December 1987, pp. 19-22. Detailed critique of the Minnesota Twin Study and its anecdotal reports alleging to show that IQ, personality traits, and "virtually every other mental attribute or behavior is heritable." Lambastes research head Thomas Bouchard for engaging in a publicity campaign based on anecdotal evidence and failure to publish results in any refereed scientific journal, "thus circumventing the scientific process and using the media for public relations." "What is striking about the anecdotal material [about remarkable coincidences said found among twins reared apart] is its similarity to the sort of evidence often offered as proof for astrology or parapsychology. . . . We are told about the similarities (seven rings on fingers, sneezing in elevators) but not about the differences." Concludes Dusek: "The media anecdotes about 'eerie' and 'freakish' coincidences that 'struck' Bouchard must remain on a par with tales about astrology and ESP. And Bouchard's data and methods must remain in that limbo in which Cyril Burt's imaginary assistants and unverifiable data existed."

Huyghe, Patrick. "Voices from Inner Space." *Hippocrates,* July/August 1988, pp. 88-89. Discussion of people who hear voices.

Jones, Pat. "Mars Reveals Its Second Face." *New Scientist,* August 25, 1988, p. 62. Good column on the Mars-face business, including mention of the paper in *Applied Optics* by Carlotta and of a second "face," dubbed Satan. "What is upsetting scientists," writes Jones, a producer at the Johnson Space Center, is that "they are impotently left to try to reason against hypotheses derived from exciting new technological tools that, in this case, offer no new scientific insight." He cautions against image-enhancement to satisfy an expectation and warns that it "can only help to clarify what is present in the image; it cannot create data."

Leikind, Bernard J., and William J. McCarthy. "Firewalking." *Experientia* (Switzerland), 44:310-315, 1988. Summary of the authors' investigations (see *SI,* Fall 1985) demonstrating that elementary knowledge of physics and psychology explains the known instances of firewalking. Part of a single-topic review issue on investigations of the paranormal.

Merikle, Philip M. "Subliminal Auditory Messages: An Evaluation." *Psychology & Marketing,* in press. University of Waterloo psychologist evaluates subliminal audio cassettes marketed by several distributors. Spectrographic analyses find no identifiable speech within the background sounds. Listeners could not distinguish between "signal" and "placebo" cassettes in a forced-choice detection task. Concludes that the cassettes do not contain any embedded subliminal messages that could conceivably influence behavior.

Molony, Carol. "The Truth About the Tasaday: Are They a Primitive Tribe—or a Modern Hoax?" *The Sciences,* September/October 1988, pp. 12-20. Stanford anthropologist examines both sides of the controversy over whether the Tasaday people discovered in the Philippine jungle in 1972 are Stone Age primitives or participants in an elaborate hoax. The author criticizes the need to view them in this black or white dichotomy. Suggests that, while perhaps the Tasaday *were* encouraged to display their most primitive attributes to outsiders, "there is simply no getting around the linguistic evidence of their authenticity."

Moore, Timothy E. "The Case Against Subliminal Manipulation." *Psychology & Marketing,* in press. This article, and Merikle's, above, are part of a special issue on subliminal influences in marketing. Moore, a York University psychologist, is

guest editor and contributes an editorial as well as this article, in which he concludes, after a review of pertinent research purporting to demonstrate four claims, "that there continues to be no evidence that subliminal messages can influence motivation or complex behavior.

Skolnick, Andrew. "Faith Healers: How Charismatic 'Healers' Promise Miracles While Picking the Public's Pocket." *Social Issues & Healthcare Review,* Spring 1988, pp., 46-52. Reporting on investigations into W. V. Grant, Peter Popoff, and other faith healers.

Skrabanek, Petr. "Scepticism, Irrationalism and Pseudoscience." *Speculations in Science and Technology* (12 Clarence Road, Kew, Surrey TW9 3NL, England), 10(3):191-199, 1987. Delightful essay, with sections on skepticism, wishful thinking, open mind or open sink, and demarcation of the absurd.

Swann, William B., Jr., Brett W. Pelham, and Thomas R. Chidester. "Change Through Paradox: Using Self-Verification to Alter Beliefs." *Journal of Personal and Social Psychology,* 54(2):268-273, 1988. Suppose you have a weak belief that men make better bosses then women. Being weak, it involves little personal investment. Therefore contrary questions ("Why do women make better bosses than men?") can change your mind because there is little resistance to believing your own answer. Conversely, if your belief is entrenched, nothing happens. But watch out—the authors find you can be moved just as easily by questions that encourage even more extreme views ("Why do men *always* make better bosses than women?"). Since you resist change, you think up reasons for the positions being untenable—and unwittingly change your beliefs in the opposite direction! Interestingly, the authors show that the change is a true shift in position rather than a recognition that more extreme views exist. So next time you debate the paranormal, ask questions like "Why are UFOs destroying the earth?" "Why is psi so common?" and "Why does astrology deny free will?"

Toumey, Chris. "Martian Rocks and Moral Responsibility." *News and Observer,* Raleigh, N.C., July 15, 1968, p. 17A. Anthropologist's column criticizing beliefs that mysterious civilizations elsewhere have greater knowledge and wisdom.

Westheimer, Frank. "Education of the Next Generation of Nonscientists." *Chemical & Engineering News,* July 4, 1988, pp. 32-38. Text of Priestley Medal address by eminent American chemist and educator "proselytizing for more science for nonscientists."

—*Kendrick Frazier*

CSICOP Education Subcommittee

Recent surveys show that 28 percent of Americans believe the sun revolves around the earth, 33 percent of American teachers believe humans lived at the same time as dinosaurs, 30 percent of the same teachers believe in creationism, and 28 percent believe some people have psychic powers that enable them to predict the future.

CSICOP would like to upgrade its Education Subcommittee to meet the challenge of widely held pseudoscientific and paranormal beliefs. We are therefore seeking new members. If you are interested, please send your vita to Mark Plummer, CSICOP, Box 229, Buffalo, NY 14229.

Follow-Up

Morphic Resonance in Silicon Chips

Rupert Sheldrake

IN THE SPRING 1988 SKEPTICAL INQUIRER, Varela and Letelier described an experimental test of the hypothesis of formative causation that they claimed either falsified it or would entail a "substantial modification of the hypothesis as stated now" (p. 300). This hypothesis was proposed in my book *A New Science of Life* (Tarcher, Los Angeles, 1982) and is further developed in my *Presence of the Past* (Times Books, New York, 1988). It was also discussed by Martin Gardner in the Winter 1986-87 SKEPTICAL INQUIRER (pp. 128-131).

The article by Varela and Letelier is a slightly modified version of a paper they wrote more than five years ago. Varela sent me a copy in 1983 and suggested that I reply to it and also that we try to publish our replies and rejoinders on the subject together with the original paper. We agreed to do this, and over a period of several years exchanged arguments for and against his opinion that this experiment falsified the hypothesis, or at least necessitated "extensive ad-hoc revisions." The last letter in this series was one from me to him in January 1987 in which I pointed out that his experimental design involved a fatal flaw.

I was surprised to find that Varela and Letelier had published their paper in SKEPTICAL INQUIRER without mentioning this correspondence, or taking into account the theoretical and technical criticisms made by myself and others. I would like to bring the situation up to date by pointing out the main objections to their experimental design and the conclusions they draw from it. I start with a brief outline of the hypothesis of formative causation so that their experiment can be seen in context.

The hypothesis of formative causation proposes that self-organizing systems like atoms, molecules, crystals, organelles, cells, tissues, organs, and organisms are organized by morphogenetic, or morphic, fields. These fields have a kind of inherent memory that depends on a nonenergetic process called "morphic resonance," through which they are influenced by the form and behavior of previous similar systems. Such fields can be thought of as "probability structures"; they act by influencing the probability of otherwise indeterminate events within the systems under their influence (*A New Science of Life,* p. 118).

The hypothesis makes a wide range of testable predictions. For example, when new kinds of chemicals are crystallized repeatedly, their crystals should tend to form more readily all over the world, owing to the cumulative morphic resonance from previous similar crystals. Or when rats learn a new trick in one place, then similar rats elsewhere should, on average, be able to learn it more quickly because of

morphic resonance from the earlier rats. The more rats that learn it, the greater should this effect become. In my books I outline a variety of experimental designs that could be used to test these and other predictions.

The experiment of Varela and Letelier involved programming a microcomputer to carry out a particular sequence of operations according to a program they wrote themselves. They then measured the rate at which this program was executed to see if it was completed any faster after millions of repetitions. It was not. This is the result that they claim refutes the hypothesis of formative causation, or at least necessitates extensive ad-hoc revisions. The main criticisms of their claim are as follows:

1. *Silicon chips are not organized by morphic fields.* Varela and Letelier assume that the movement of valence electrons and "holes" in a semiconductor device is equivalent to the process of crystallization. They explicitly state that what goes on inside a silicon chip in response to the computer program is equivalent to the synthesis of a new "crystal," and repetitions of the program are equivalent to "re-crystallizations."

I argue that there is a difference in kind between the formation of a crystal and programmed changes in a silicon chip. A silicon chip, such as the Intel Z80 chip in the central processing unit of Varela and Letelier's computer, does not grow spontaneously under the influence of a Z80 morphic field. Rather, its structure and electrical properties are imposed upon it by doping, photoetching, and other processes in the course of its manufacture. It is in effect a miniaturized version of a printed circuit board with the transistors, resistors, and capacitors built in. The slice of silicon crystal serves as a support, like a board, and also contains thousands of electronically separate regions that can function independently of one another. The chip is not an example of a self-organizing system, and the hypothesis of formative causation does not apply to its manufacture or its programmed functioning.

Most of the correspondence between Varela and myself has concerned this distinction. He claims there is no difference in principle between the manufacturing of a silicon chip and the spontaneous growth of a snowflake or an embryo. He continues to assert that there is no fundamental distinction between programmed changes inside silicon chips and the crystallization of a newly synthesized chemical. By contrast, I argue that there is a fundamental distinction. In Varela's opinion, the recognition of this distinction necessitates extensive ad-hoc revisions of the hypothesis of formative causation. In my opinion it does not.

2. *Formative causation cannot occur in determinate machines.* The hypothesis postulates that formative causation involves the modification of probabilities in probabilistic systems. Morphic fields work by patterning the outcome of otherwise indeterminate changes. Possibly an entirely new kind of computer could be constructed in which morphic fields might indeed play an organizing role; but such a computer would have to contain a large number of indeterminate elements, for example, chips so thin that their operation is subject to random fluctuations at the quantum level. Varela and Letelier's computer was not an indeterminate system in this sense; and hence there was no scope for its activity to be organized by morphic fields.

3. *The computer's internal clock fixed its speed of operation.* Even if Varela and Letelier had been right in thinking that, according to the hypothesis, programmed changes in silicon chips ought to be subject to morphic resonance, their experiment is flawed for a simple technical reason. Their computer works, like other computers,

by means of a rapid series of operations pulsed by the computer's internal clock. Their deterministic instructions were synchronized and paced by this clock, with a unit operation time of around one microsecond. Even if the transistors within the silicon chips did respond faster to the pulsed instructions as a result of morphic resonance, the sequence of operations in Varela and Letelier's program could not have speeded up. The rate at which successive steps of the program were executed was fixed by the clock.

I conclude that the experiment of Varela Letelier is not a valid test of the hypothesis of formative causation. •

Rupert Sheldrake, a biochemist and plant physiologist, is the originator of the hypothesis of formative causation. He lives in London.

Francisco Varela Responds

JUST A FEW words in response to Sheldrake's letter. I believe that the basic points he raises have already been addressed in our previous rejoinder (Fall 1988, p. 101) to the supposed "fatal flaw" in the design of our experiment. I do not wish to repeat any of it here, but just to clarify a couple of other points he raises.

It is true that we corresponded with Sheldrake about his criticism of our simple experiment. The original idea of publishing together dragged on a long time (five years!) and seemed to go nowhere. When we became aware of the existence of the SKEPTICAL INQUIRER, the whole exchange did not seem very relevant anymore and somewhat Byzantine. It still seems to me to be so. One can argue about what is and what is not a self-organizing system (e.g., an embryo yes, but not a man-made molecular pattern) *ad infinitum*. This basically underscores our contention that once one pushes the idea of morphic resonance into concreteness it *does* require refinements, such as distinguishing the natural from the man-made or the probabilistic from the deterministic. These are complex distinctions to make, and they do not appear in his original book. Nor does the word *self-organization* or an equivalent. Sheldrake trivializes my position when he says that I claim "there is no difference between manufacturing a silicon chip and the spontaneous growth of an embryo." Certainly there are. That's why our comparison was based on molecular/atomic events. But, again, to go on with this argument misses the point entirely.

I conclude that our experiment *is* certainly a valid test of the ability of the hypothesis of formative causation to be tested.

—Francisco Varela

Forum

Crystals: Icons of Nature's Design

Chet Raymo

THEY ARE "the cosmically charged cornerstones upon which the great pyramids of Egypt were built." They are "natural superconductors through which a universe of enlightenment passed to the lost continent of Atlantis." They are crystals, and if you know how to use them they can make you healthy, wealthy, and wise.

Or so believe a growing number of New Age people who use crystals in every aspect of their daily lives, often with horoscopes, herbs, incense, and elixirs. Beryl crystals, for example, relieve stress. Diamonds guard against envy. Azurite heightens dreams. Garnet improves self-esteem. And good old white quartz is an energizer, channeling into your environment the very best of cosmic vibrations.

Bookstores are full of crystal self-help books, or you can pay $75 an hour to visit a crystal consultant. We knew crystals had made it big when they appeared on the cover of *Time* in the hands of New Age guru Shirley MacLaine.

Now it happens that I have on my desk a cluster of quartz crystals almost identical to those on the *Time* cover. And as a matter of fact, a number of good things began happening in my life at about the time I got the crystals.

Have I become a New Age believer?

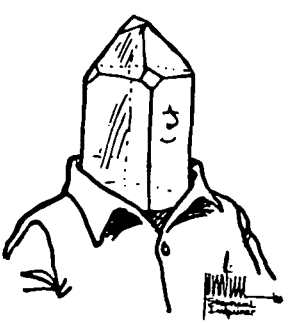
Stephen Jay Gould once wrote that the "human mind delights in finding pattern—so much so that we often mistake coincidence . . . for profound meaning." Science is one highly successful apparatus for winnowing the wheat of profound meaning from the chaff of coincidence. And in the matter of crystals, I'll stick with science.

The coincidence between my crystals and my good fortune was just that—coincidence. Yet the crystals are on my desk for a profound reason, and the reason is delight in pattern.

Crystals are windows on the world of atoms. Perhaps better than anything else in our natural environment they exemplify the patterns of order that are built into nature on the atomic scale.

The quantitative science of crystals began in the seventeenth century, when the Danish natural philosopher Nicolaus Steno noticed that the faces of quartz crystals always meet at the same angle. No matter how big or small the crystal, or its shape or its place of origin, the angles are the same.

While I was writing this piece, I put



my cluster of quartz crystals under a microscope and entered a world of spectacular architectural forms—gorgeous, icy-smooth planes colliding this way and that to form a space-age city of towering pillars and plunging chasms. And at every edge, Steno's unvarying angle of 120 degrees. A hint of constancy in the midst of chaos.

In the late eighteenth century, the mineralogist René-Just Haüy made another remarkable discovery about the nature of crystals. According to the story, Haüy was examining a large calcite crystal in the home of a friend, when he dropped it. To his embarrassment, it shattered. When he stooped to pick up the pieces he noticed that every fragment, large and small, had the same basic shape as the original crystal. "Tout est trouvé!" shouted Haüy. "All is discovered!"

Haüy rushed back to his lab and smashed a calcite crystal into tiny bits, and every piece resembled the parent. He reasoned that the smallest units of the crystal—perhaps even on the atomic scale—would have the same shape.

In the twentieth century, X-rays confirmed Haüy's conclusion. The shape of a crystal is determined by the way atoms of that substance bind together to form "lattices"—repeating arrays of space-filling atomic units. In all of nature there are only a few classes of fundamental crystal shapes, and these can be predicted mathematically. Yet no two crystals are exactly alike, and that too is part of their attraction.

Tiny traces of impurities add color to crystals—emerald, sapphire, ruby, aquamarine. Pure quartz is clear; the amethyst color of my quartz cluster probably derives from tiny traces of iron. This kind of departure from perfection enhances the beauty and value of the crystals.

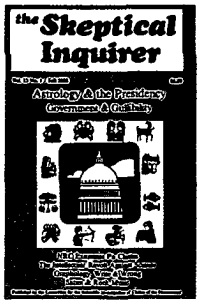
Under the microscope my apparently regular quartz crystals become a showcase of imperfections—color variations, striations, cracks, and inclusions, including some wonderful starburst crystals of goethite (if my guess is right) embedded within the quartz—patterns within pattern.

All of this beauty hints at things still beyond the crystallographer's ken. Most mysterious of all is the riddle of crystal growth. If crystals grow by adding atoms at the surface, and if atoms fall into place essentially at random, then why aren't those shimmering surfaces that I see in my microscope bumpier?

And consider the perfect symmetry of the snowflake. How do atoms attaching themselves at one tip of the growing six-sided crystal know what's happening at another tip? The answer may have something to do with vibrations within the crystal, vibrations of exquisite sensitivity that maintain a delicate—dare I say cosmic—balance between order and disorder.

Are the crystals on my desk channeling those cosmic vibrations into my personal life? I think not. Crystals are delightful icons of design in nature, but the New Age wheat of profound meaning is my chaff of coincidence. •

Chet Raymo is a professor of physics at Stonehill College in Massachusetts and author of several books on science, including The Soul of the Night. *Reprinted by permission from his "Science Musings" column in the* Boston Globe.



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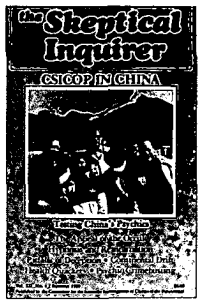

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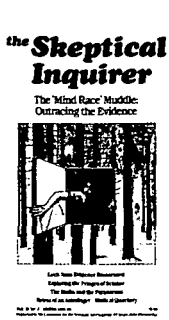

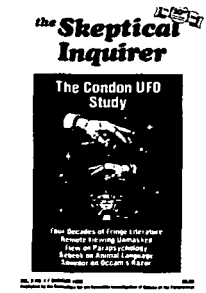

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(continued on next page)

Back Issues (cont'd.)

Kenneth L. Feder. Battling on the airwaves, *David B. Slavsky.* Rhode Island UFO film, *Eugene Emery, Jr.* Landmark PK hoax, *Martin Gardner.*

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Ghostbusting

Henry Gordon

ON HALLOWEEN night in 1987, the Canadian Broadcasting Corporation, Canada's giant radio and television network, broadcast a radio special out of Halifax, Nova Scotia, featuring a couple of ghostbusters exorcising a pair of spirits from a troubled local household.

Just another Halloween prank story to fit the occasion, right? Well, not quite. The program did fit quite neatly into spook night, but the intent was to actually rid a house of ghosts. And the CBC personnel involved seemed to take it quite seriously.

It all began when the MacLean family (not their real name), who had recently moved into an old house on the South Shore, heard a "Basic Black" broadcast on CBC radio. This is a weekly network program hosted by Arthur Black, a highly respected, humor-oriented broadcaster.

A guest on the show that day was Ian Currie, who teaches sociology at Guelph University in Ontario. Currie is the well-known occultist who wrote *You Cannot Die*—a book packed with undocumented anecdotes "proving" the case for immortality.

The MacLeans heard Currie describing his career of chasing ghosts out of various and sundry domiciles. (This is only one of his avocations. He also claims to keep busy hypnotically regressing people to past lives and has a high profile in Canadian paranormal circles.)

Mrs. MacLean, who allegedly had been hearing strange noises in the house and experiencing other weird phenomena, was in such a state that her husband and children were seriously concerned. When they heard Currie, they called CBC and asked for his assistance.

John Dalton, network variety producer in the Maritimes, leaped to the rescue. He contacted Keith Duncan, CBC head of radio variety, in Toronto. Top brass approved the project and, although CBC claims to be short of funds—which come from the public purse—they hired and airlifted Currie and his sidekick, psychic Carole Davis, to Halifax. Arthur Black also joined the entourage.

Once at the MacLean home, Currie and Davis went through their usual de-

haunting rituals, which ended with their giving the spiteful spirits definite orders to "get out."

So what were the results of all this spookery, apart from the fact that CBC filled an hour of air time? According to all parties involved, the MacLeans were convinced that the ghosts were gone.

In retrospect, what was the reaction of the network personnel involved? CBC publicist Linda Litwack said: "CBC was at the core of the whole thing. . . . It's very exciting."

Arthur Black, not too enamored of the past debunking activities of this writer, was wary when he talked with me; but when pressed, he said: "I was impressed by what happened, and I did not sense a scam going on."

Keith Duncan was asked why the CBC had not brought in an informed skeptic for a possible natural explanation for the strange phenomena, so the public would get some sort of balanced viewpoint. "We didn't present it for balance," said Duncan. "We presented it as we called it, a ghost story. We didn't treat it as a balanced piece of journalism."

Oh, then it was not a serious effort? It was just a Halloween prank story? "No it was definitely not a Halloween prank story. . . . Arthur Black and John Dalton were both convinced there was something in this."

Producer John Dalton's reaction? "I tend to be more of a believer now. . . . Either he [Currie] got rid of two spirits or he put on such a good show that the husband and wife believed him." Which theory did Dalton subscribe to? "I tend to believe that they [Currie and Davis] did get rid of a couple of souls. . . . I was really watching them for a scam, and from what I observed they're not a real team."

Mr. Dalton might be surprised to learn that Carole Davis and Ian Currie have been a dehaunting team for several years. I debated them as a team on a television program a few years ago.

The bottom line is that the troubled MacLean family has allegedly been helped, at least for the time being. Does this mean that a person is better off consulting an occultist and a so-called psychic than getting the help of a psychologist or a psychiatrist? And should the CBC be underwriting psychics and promoting their credibility at the same time?

I have been critical in the past of several programs produced by the Canadian Broadcasting Corporation, both on radio and on television, programs that express paranormal views with little, if any, rational response. The network consistently produces many high-quality programs that earn the public's respect and trust. All the more reason why its producers should present more balance in their presentation of paranormal subjects.

The public isn't getting a fair shake.

Henry Gordon is a magician, broadcaster, lecturer, and writer. He is chairman of the Ontario Skeptics.

Where Science and Poetry Meet

"I was struck by your quotation from Richard P. Feynman on page 397 of your Summer 1988 issue," writes Ron Ellis, a professor of English at the University of Wisconsin-Whitewater. "I would like to respond to his challenge to poets ('Far more marvelous is the truth than any artists of the past imagined! Why do the poets of the present not speak of it?') by challenging you to consider publishing poetry that connects scientific knowledge with poetic imagination. Since a main thread of my work consists of just this connection, I am enclosing a poem, in honor of Feynman, for your consideration. It seems to me that poets have an obligation to inform their work with scientific truth whenever it is applicable. Would you agree that science publications should occasionally find room for works of the imagination that fulfill this obligation?" We do agree, and we take pleasure in presenting Dr. Ellis's poem. "Wave Forms."—EDITOR.

Wave Forms

for Richard P. Feynman (1918-1988)

Hickory nuts lie like seashells
whose oxygen molecules reveal
a half-million-year cycle
of the earth's magnetic field.
Putting down the magazine, looking up,

I imagine particles charged
by solar wind colliding with
the magnetosphere,
"mischief that can make cab-drivers in
Alaska obey dispatchers in New Jersey."

Here a chipmunk totes a nut. Up there
solar flares generate waves called ELF
that circle the earth continually.
We generate them, too,
send them to subs hemispheres apart.

When the length of those waves
equals the circumference of the earth,
it is the same as the brain's
alpha waves that lap the shore of mind.
I can hear tides of wind.

Around me dried leaves tumble.
I close my eyes to the sun rippled
by lattices of hickory. Shock waves
pierce the boundary layer
so the magnetotail weaves curtains

on the night side, sheets of red
or yellow-green that curl and fold.
From space they appear as ovals
of auroral light.
I stroll home in the oncoming dark.

—RON ELLIS

"Wave Forms" by Ron Ellis first appeared in Eleven Wisconsin Poets *(Kendall-Hunt Publishing Co., Dubuque, Iowa), 1987, p. 33.*

From Our Readers

Pitfalls of perception

Anthony Wheeler's article "Do My Eyes Deceive Me? Pitfalls of Perception" (*SI*, Summer 1988) attributes a higher number of dusk UFO sightings to the physiology of our senses, which causes things to be "seen" in dim light. More important causes are probably the greater number of seemingly unusual stimuli and observers at this time of night. He also neglected to mention two physiological phenomena that probably contribute to more UFO sightings than any others: *autokinesis* and *autostasis*.

One study (*Scientific Study of Unidentified Flying Objects*, E. U. Condon et. al., 1968) found that 18 percent of UFO reports were due to artificial satellites. Bright, naked-eye satellites are most easily seen within two hours of sunrise or sunset, when reflected sunlight contrasts most with the darkening sky. The same study found that Venus was an oft-reported "astronomical UFO" (fully 28 percent of all UFOs were astronomical objects). At greatest brilliancy Venus outshines everything but the sun or moon and is never more than 39 degrees from the sun, often presenting a strange appearance in twilight. Aircraft also seem strange and bright when illuminated by the just-set sun.

Autostasis is caused by eye-muscle movement, which makes a moving object, such as a distant plane or satellite, seem to stop or zig-zag. Similarly, *autokinesis* causes a distant plane, balloon, or astronomical object to "swing" as if on a parachute. This is the obvious cause of the "falling leaf" effect cited by many UFOlogists as a typical feature of flying-saucer movements.

These effects are often attributed to a lack of nearby references, but I have found them most pronounced when the object is less than 30 degrees high with no close references but with reference objects, such as the horizon, in peripheral view. This enhances the "strangeness" of the object when compared with other things on the field of view.

Another twilight effect is increased atmospheric turbulence, which can cause distant man-made and natural objects, particularly stars, to twinkle in bizarre ways. The first and perhaps the most important cause of more twilight UFO sightings is probably that there are just fewer people watching as the evening progresses.

Robert R. Young
Education Chairman
Astronomical Society of Harrisburg
Harrisburg, Pa.

Anthony Wheeler's article brought to mind my encounter some years ago with an apparent UFO. While looking out the fourth-floor window of a laboratory here in the desert, I observed an approaching Dust Devil, one of those small whirlwinds common in the desert in the summer. As it crossed the parking lot, the dust thinned out but the wind picked up several small pieces of metal foil. The foil rose gradually, darting back and forth in the wind, and looked like foil as long as it was against the desert background. The moment it rose high enough to be visible against the blue-sky background the appearance changed completely. Now, instead of looking like small pieces of foil nearby, it looked like giant silvery ships darting back and forth at high speed and performing impossible maneuvers above the distant mountains. Even

though I knew it was only foil, the illusion was very strong, and a person who had not seen the whole sequence could easily have believed it was a genuine UFO sighting. Undoubtedly many other reports of the strange occurrences would have equally simple explanations if the full story were known.

Jack A. Crawford
Ridgecrest, Calif.

I am skeptical of Anthony Wheeler's claim that "it is not unusual for an amputation patient to persuade an inexperienced nurse that the only way to relieve an itch is for her to retrieve the lost limb so that it can be scratched!" Can he document even *one* case involving such an "inexperienced" (and incredibly dim-witted) nurse, or is the "nurse" part of the story entirely apocryphal?

Jeffry D. Mueller
Finksburg, Md.

Astrology

The recent flap over the use of astrology in the White House (*SI*, Fall 1988) has once again brought the popularity of this ancient superstition to wider public attention.

In discussing astrology with students or people with little science background, I find the following analogy can often be helpful. (I offer it to SKEPTICAL INQUIRER readers who may be drawn into discussions of astrology.)

Imagine that someone proposes a system called "jet-ology," which claims that the positions of all the jumbo jets in the world at the moment a baby is born will have a significant effect on the child's personality or future life. For a substantial fee, a "jet-ologer" with a large computer might offer to do an elaborate chart, showing the positions of all the planes at the right time and to interpret the complex pattern of the plane positions to help you understand their influence on your life. No matter how "scientific" or complex the chart of jet positions turned out to be, any reasonably skeptical person would probably ask *why* the positions of all these planes should have any connection with someone's personality or with the events that shape human lives.

Since today we understand that the planets and other celestial objects are no more magical than jumbo jets, we should not hesitate to ask the same sort of questions of astrologers that we might ask of "jet-ologers."

Andrew Fraknoi
Executive Officer
Astronomical Society of the Pacific
San Francisco, Calif.

I noted your mention in the Summer issue (p. 343) of the *Washington Post*'s resident astrologer. When the story came out recently that Mrs. Reagan, and possibly the president as well, consulted astrologers, I was struck by the remarkable lack of criticism by the news media. While there were stories and jokes, there were no hints that there might be something wrong with astrology itself, and in fact there were a number of articles and news stories taking it seriously. I don't know which appalls me the most—the fact that the president's agenda and decisions might be influenced by astrology or the obvious fact that the American news media don't seem bothered by it.

Robert M. Gross
Charlotte, N.C.

For excerpts of media criticism of astrology, see "Astrology and the Presidency" in our Fall issue.—ED.

Inverted worlds

I was interested to read Martin Gardner's column about Abdelkader's inversion hypothesis (*SI*, Summer 1988), which holds that the earth is inside-out and the rest of the universe is within. However, I would like to suggest an alternative.

Suppose, not the earth, but the moon were inverted. The earth would orbit inside of the moon, and everything else would be within the earth's orbit. The same mathematics that support Abdelkader's inversion hypothesis would support my lunar inversion hypothesis. In fact, there is no scientific reason to prefer one to the other. Anyone who agrees with Abdelkader's hypothesis must agree that mine is equally plausible.

But—oops!—what about Mars? Could it be inverted? How about the sun? Or Alpha Centauri? Or some planet in a distant galaxy? The same model would support any of them as containing the universe. There is nothing special about the earth; the others are just as likely.

Suppose there are 10^{23} eligible bodies in the universe. Then the chance that we happen to be standing on the inside of the particular one that contains the rest is $1/10^{23}$, or pretty close to zero.

Therefore, even if we accept Abdelkader's reasoning and agree that the universe is inverted, it still requires a leap of faith to believe that we are on the perimeter. We would, much more likely, be a tiny speck near the center of a vast and unknown world. A humbling thought!

Forrest Johnson
Goleta, Calif.

Acceptance of paranormal among two special groups

We all know that belief in paranormal theories (astrology, biorhythms, UFOs, etc.) is not restricted to less-educated people, but is spread over all classes in our society. What is the level of acceptance for some of these theories among well-educated and intelligent people? That is what this letter tries to show for two special groups.

The first group is the set of all 281 professors in a small university (L'Université du Québec à Trois-Rivières, Québec, Canada). During the winter of 1986, we contacted all of them and received 206 responses (73%). To take into account the 75 who refused or neglected to answer, we made some sampling corrections, but the results should be considered approximations only.

The second group includes those who attended a meeting of a Mensa club in Québec city, in June 1988. Mensa is a club restricted to people with high IQs. To be admitted to the club, a candidate must succeed in special IQ-oriented tests. At this meeting the Mensa members were with their escorts, so the results are for "Mensa and Escort." There were a total of 41 persons present.

Each group was invited to fill out a short questionnaire asking for the level of belief and interest in seven subjects: divination, astrological signs, telepathy, psychokinesis, water-diviners, biorhythms, and extraterrestrial visitors. For brevity, I do not give here the detailed questions, but each subject was explained clearly in the text.

Each question on belief had the form: "Do you believe that . . . .?" And there was a choice of five responses: (1) Yes, (2) I think "yes," but I am not sure, (3) I don't know, (4) I think "no," but I am not sure, (5) No. The percentages shown below are for the first two responses: They represent the percentages of people who believe in the subject, *with or without restriction.*

Subject	University Teachers %	Mensa and Escort %
Divination	31	51
Astrological signs	26	44
Telepathy	61	73
Psychokinesis	30	39
Water-diviners	53	61
Biorhythms	43	51
Extraterrestrial visitors	18	56

We see that in the Mensa and Escort group, surely all intelligent persons, the level of acceptance is very high. For my university colleagues, the level is happily lower, but still very disappointing. Almost 1 in 3 believe (possibly with reservations) in divination, and 1 in 4 in astrological

signs.

Women were significantly more disposed than men to believe in telepathy, divination, and biorhythms.

The sub-questions on interest revealed a very low interest in all these subjects.

We skeptics have definitely a big job to do to furnish factual information and spread the skeptical point of view to even well-educated and intelligent people.

Guy Châtillon
Trois-Rivières
Québec, Canada

Guy Châtillon is professor of statistics at L'Université du Québec à Trois-Rivières, Canada.

Religion and superstition

Barry Beyerstein's article "Neuropathology and the Legacy of Spiritual Possession" (Spring 1988) mentions several times the relation between neuropathology and certain religious beliefs and experiences. He thereby brings up a subject that, it seems to me, you have been trying to avoid: the relation between established religion and superstition. I can well imagine that you don't like to pick a fight with any church (or mosque, synagogue, temple, pagoda, etc.); as the French say: "Qui mange du Pape y meurt." Nevertheless, and considering Beyerstein's bold gambit, there must be a few avenues that can be explored further.

For instance, you complain about the failure of students to distinguish between science and pseudoscience. Has anyone investigated whether religious teaching is to blame? After all, most children are taught in Sunday school to believe on faith, and this is presented as a virtue. But once you teach children that some uncritical, irrational beliefs are acceptable, there is no limit to what they will accept on faith.

Let me add one more example to the many you publish: Some years ago I saw on television a group of people coming back from the Philippines, where they had undergone "knifeless surgery." One of them was interviewed, and he showed a blood-soaked surgical towel that had been used for his "operation." The journalist reminded him that somebody else had had a similar rag analyzed and had been told that it was chicken blood. The poor fellow's answer: "If my faith is so weak that I have the blood analyzed, then I deserve chicken blood." In such an answer the influence of religious teaching is clearly audible. Did anybody study this tendency of religious teaching to lead to superstitious beliefs and to counteract rational teaching?

Herman J. van Norden, M.D.
Vancouver, B.C., Canada

Challenge to relativism

I've read items in previous issues of *SI* dealing with creationists and fundamentalists and was pleased to see them debunked. However, skepticism in modern society faces a more serious challenge from the opposite end of the philosophical spectrum: relativism.

Brown University is hardly a microcosm of society in general, but it still worries me that I meet so many hardcore relativists here as a freshman. While I met only one student who might object to the teaching of evolution, I met many who see science as a "Western" way of viewing the world, no more valid than any other system of belief. A case in point is a student I talked to who defended the pseudoscientific practices of African witch-doctors on the basis of the liberal attitude that what is false for European/American civilization need not be so for other cultures.

Such attitudes leave Brown students subject (not only to the obligatory rhetoric of the political Left but) to visits from mystics like "Swami Beyondananda," an astrologer named Carol who performed an astrological diagnosis of the state of the union, and agents of the notorious Maharishi Yogi. The Yogi's PR team offered (to those who would pay $145 to learn Transcendental Meditation) powers of levitation and "Increased

Brainwave Coherence." A poster behind the Yogi's agents in the lecture room they borrowed on campus depicted the "derivation" of Transcendental Meditation from unified-field physics. The poster also defined immortality as "the trans-time invariance of the Lagrangian density." Now *that's* pseudoscience.

The SKEPTICAL INQUIRER frequently notes the wish-fulfillment appeal of pseudoscience. However, the fact is that most people who hold a mild belief in the supernatural do so not out of wishful thinking or dogmatism but out of the view (espoused by the Left and by New Agers in different contexts) that, because nobody seems to have all the answers, there are no absolute truths: not religion, not pseudoscience, and not science. At least the fundamentalists take up firm, contestable positions. Relativism can be fought only through philosophy, which is something writers for the SKEPTICAL INQUIRER should think about.

Todd Seavey
Norwich, Conn.

J. W. Grove's article "The Intellectual Revolt Against Science," published in our Fall issue after this letter was received, discusses some of these issues and concerns.—ED.

Bar-code-digit devils

With regard to "The Bar-Code Beast" (*SI*, Summer 1988), at least two things are wrong. First, the sequence of seven bits (0s and 1s or spaces and bars) following the 101 at the beginning is not an "introducer" code but the code for the digit zero. It designates a class of merchandise, and in fact the zero is usually printed front and center of the bars. I have no idea how the digit is chosen; my experience is that the vast majority of items begin with zero, but if you wander into the "drug" section of the supermarket, some products have a 3 at the beginning; also, coupons (the kind that clutter up your Sunday newspaper) that have the full 10 + 2 digit code begin with 5.

Second, the checksum at the end is obviously not 7—either by looking at the figure or by arithmetic. The digit is 2 in the right-hand complement code (that is, 1101100). It is calculated in the following way: Multiply alternate digits (starting with that first zero) by 3; add them to the remaining digits. The checksum is then appended to add to zero mod 10. Thus:

$$3(0 + 1 + 3 + 5 + 6 + 8) + 0 + 2 + 4 + 6 + 7 = 88 \text{ plus } 2 = 0 \bmod 10.$$

As a final comment, consider the 6-digit codes on some physically smaller products. (Check your next candy bar.) The code starts with 101, as does the 10 + 2 digit code, but ends with 010101; and since all individual digit codes in the 6-digit version end with 1, the final group is always 1010101. A veritable nest of devils!

Arthur Tiedemann
Madison, Wis.

Michael Keith responds:

Arthur Tiedemann found two errors in my article. The text describing Figure 1 does not match the figure; the checksum is obviously not 7 but 2 (1101100). Also, the formula for the checksum in the UPC is not, as stated in the article, $a + b + c + d + e + f + g + h + i + j \pmod{10}$ where a–j are the 10 digits of the code. The correct formula is $-3(I + b + d + f + g + j) - (a + c + e + g + i) \pmod{10}$, where I is the "introducer" digit (the digit preceding the 10-digit code—usually 0, but not always).

True-false troubles

I have long been skeptical of the type of opinion survey reported in your Summer 1988 News and Comment section. It seems to me that greater care needs to be taken with the wording of questions. While reading the column, I imagined myself to be a hard-nosed, sardonic,

overworked editor, like Walter Burns or Lou Grant. Across my busy desk comes Michael Zimmerman's list of questions. Since I am an A-type person, I chomp on my cigar and quickly check off the answers. (My thoughts while doing so are in parentheses.)

"The Earth is approximately 6,000 to 20,000 years old." *True.* (At least 6,000—maybe a lot more.)

"The Earth is approximately 4 billion to 5 billion years old." *False.* (It's about 15 billion—"Earth" sometimes is used to mean "universe.")

"Dinosaurs and humans lived contemporaneously." *True.* (Both lived contemporaneously with insects.)

"Adam and Eve were actual people." *True.* (Adam Smith and Eve Arden.)

"Every word in the Bible is true." *True.* (The words are true. It's the sentences that are false.)

As a high school teacher for more than 30 years, I've constructed many tests and quizzes of the true-false type and realize how difficult it sometimes is to make up a concise statement involving a complicated idea and state it in entirely unequivocal terms. Believe me, if an alternate meaning can be found, some reader will be sure to find it.

Notwithstanding, I cannot praise your journal too highly. I try never to miss an issue.

Dave Summers
Holly, Mich.

Pauling's pronouncements

"The Appeal of the Occult," by Phillips Stevens, Jr. (Summer 1988), is excellent. He explains well many aspects of the sad, unscientific attitude of the general population today.

It is surprising, therefore, that he cites Linus Pauling's advocacy of vitamin C as an example of a scientist "making pronouncements beyond one's area of expertise." Pauling is noted for his work in organic chemistry, especially relating to life processes. This includes organic molecular structure, protein molecular bonding, immunity, antigens, etc. He and his research group have made scientific statistical studies of the efficacy of vitamin C, which are reported in books he has written on the subject.

I believe we all should consider Pauling well qualified to expound on the value of vitamin C.

Douglas P. Tracy
Toledo, Ohio

Phillips Stevens, Jr., lumps Pauling together with creation scientists. Is an anthropologist, to use Stevens's argumentation, more qualified to make pronouncements beyond his area of expertise than other scientists? I think Pauling is due an apology.

Heinz Schulze
Austin, Texas

Curriculum materials

A Ph.D. researcher in science education would be grateful to *SI* readers for help in locating sources for, or actual materials of, polls and/or curriculum materials relating to the presentation of the paranormal and scientific inquiry in elementary and secondary schools. Reference to college courses would also be helpful. Thanks to some who have already helped: Science Center, Needham, Mass.; and Biology Department, University of New Haven, Conn. Please correspond with:

Robert M. Craig, Chair
Indiana Skeptics
5401 Hedgerow Drive
Indianapolis, IN 46226
(317) 546-6149

Noisy negativists?

As the nuclear physicist who more than a decade ago began the investigation of the 1947 recovery of a flying saucer complete with alien bodies outside Roswell, New Mexico, in July 1947, and who has

devoted considerable effort to professional and objective evaluation of the "Top Secret Eyes Only" Operation Majestic-12 documents for more than three years, I am appalled but not at all surprised at the massive misrepresentation of the facts about MJ-12 in two recent articles and a recent letter in SKEPTICAL INQUIRER.

For those readers who are interested in facts instead of fiction, research instead of propaganda, detailed investigation instead of armchair theorizing, I am pleased to offer a detailed package of solid information demolishing the arguments made by noisy negativists, and at a special price to boot. Specifically I have available an 18-page single-spaced paper, "Debunking the Debunker," an 8-page printed article, "MJ-12: The Evidence So Far," and a clean copy of the Nov. 18, 1952, TSEO Briefing for President-Elect Eisenhower, the attached TSEO Truman-Forrestal Memorandum of September 24, 1947, and the supporting TS Cutler-Twining memo of July 14, 1954. The cost is only $4.00 to cover copying and mailing charges. Send check or money order (first-class postage to Canada is 30 cents) to Stanton Friedman, 79 Pembroke Crescent, Fredericton, New Brunswick, Canada E3B 2V1.

Anybody who thinks "Eyes Only" is not a legitimate marking for U.S. documents simply hasn't spent time at the various archives. There are loads of such markings.

Stanton T. Friedman
Fredericton, New Brunswick
Canada

Philip J. Klass, author of the two SI *articles to which Friedman refers, comments:*

Friedman's claim that he "has devoted considerable effort to professional and objective evaluation of the . . . Majestic-12 documents for more than three years" is puzzling, because he has publicly admitted, as reported in SI, *that he did not see a copy of the documents until late May 1987—barely one year before he wrote the letter published above.*

While Friedman was employed for 14 years as a nuclear physicist, for the past 17 years he has earned all or most of his income as a lecturer, promoting public belief in UFOs.

According to Ding

Halfway through the article on the Gang of Six's investigations in China (*SI,* Summer 1988) I became convinced that this was another of James Randi's hoaxes. Surely no self-respecting parapsychologist —Chinese or otherwise—could be so dumb!

As the father of six (children that is, not parapsychologists!), the innate cunning and hoodwinking schemes of youngsters has long ceased to faze me; how Ding Wei Xin could dignify his protegés' games by calling them "psychic demonstrations" is beyond my comprehension.

Perhaps this gentleman's incredible naiveté could be universally honored in the manner it deserves, by referring to all future ill-conceived tests of psychic ability as "having been conducted according to Ding"!

Harry Edwards
Associate Editor
The Skeptic
Manly, Australia

The letters column is a forum for views on matters raised in previous issues. Please try to keep letters to 300 words or less. They should be typed, preferably double-spaced. Due to the volume of letters, not all can be published. We reserve the right to edit for space and clarity. Address them to Letters to the Editor, SKEPTICAL INQUIRER, *3025 Palo Alto Dr. NE, Albuquerque, NM 87111.*

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We hope that these brief explanations help you understand some of the problems you may encounter. Please rest assured that the SKEPTICAL INQUIRER staff is working very hard to resolve them as quickly as possible.

the Skeptical Inquirer

Electronic Communication and CSICOP

We have now published the first edition of CSICOP's Electronic Mail (E-Mail) directory to facilitate communication between subscribers who have access to E-Mail. (Electronic mail is the use of computer equipment to receive and send text messages.) To obtain a copy send a stamped self-addressed No. 10 envelope (9½" × 4") to CSICOP marked "E-Mail Directory" in the lower left corner.

If you currently have an E-Mail address and wish to be listed in the directory, please send the following information to Barry Karr, CSICOP, Box 229, Buffalo, NY 14215-0229, USA: name of individual/organization; electronic-mail address (include specifics on space, capitalization, etc.); E-mail networks you can access (BITNET, ARPA, MAILNET, MIT, etc.); and your special areas of expertise (professional specialty or kinds of paranormal claims on which you can supply information).

A number of skeptics communicate in the Science and Math Forum of CompuServe at 9:30 P.M. U.S. Eastern time on the last Tuesday of each month. All that is required to participate is a modem-equipped computer and a CompuServe I.D. Visit any computer store or call CompuServe at 1-800-848-8199 for information on how to obtain an I.D. In most areas, access to CompuServe is available through a local phone number, and since our conferences are after 6:00 P.M. in all North America time zones, the CompuServe fees are quite reasonable. After connecting with CompuServe at the scheduled time, type GO SCIENCE at any prompt. After the Science and Math Forum menu appears, type CO and you will be in the conference. For more information write to Emory Kimbrough, 1346-B Stonehenge Road, Montgomery, AL 36117, USA, or send electronic mail on CompuServe to 72777,1553.

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Phoenix Skeptics, Michael Stackpole, Chairman, P.O. Box 62792, Phoenix, AZ 85082-2792.

California. Bay Area Skeptics, Rick Moen, Secretary, 4030 Moraga, San Francisco, CA 94122-3928.

Society for Rational Inquiry, Terry Sandbek, 4095 Bridge St., Fair Oaks, CA 95628.

Southern California Skeptics, Al Seckel, Executive Director, P.O. Box 5523, Pasadena, CA 91107; San Diego Corrdinator, Ernie Ernissee, 5025 Mount Hay Drive, San Diego, CA 92117.

Colorado and Wyoming. Rocky Mountain Skeptics, Béla Scheiber, President, P.O. Box 7277, Boulder, CO 80306.

District of Columbia, Delaware, Maryland, and Virginia. National Capital Area Skeptics, c/o D. W. "Chip" Denman, 8006 Valley Street, Silver Spring, MD 20910.

Florida. Tampa Bay Skeptics, Gary Posner, Secretary, 6219 Palma Blvd., #210, St. Petersburg, FL 33715.

Georgia. Georgia Skeptics, Keith Blanton, Convenor, 150 South Falcon Bluff, Alpharetta, GA 30201.

Hawaii. Hawaii Skeptics, Alicia Leonhard, Director, P.O. Box 1077, Haleiwa, HI 96712.

Illinois. Midwest Committee for Rational Inquiry, Michael Crowley, Chairman, P.O. Box 977, Oak Park, IL 60303.

Indiana. Indiana Skeptics, Robert Craig, Chairperson, 5401 Hedgerow Drive, Indianapolis, IN 46226.

Iowa. ISRAP, Co-chairman, Randy Brown, P.O. Box 792, Ames, IA 50010-0792.

Kentucky. Kentucky Assn. of Science Educators and Skeptics (KASES), Chairman, Prof. Robert A. Baker, Dept. of Psychology, Univ. of Kentucky, Lexington, KY 40506-0044.

Louisiana. Baton Rouge Proponents of Rational Inquiry and Scientific Methods (BR-PRISM), Henry Murry, Chairman, P.O. Box 15594, Baton Rouge, LA 70895.

Massachusetts and New England. Skeptical Inquirers of New England (SINE), David Smith, Chairman, Museum of Comparative Zoology, Harvard University, Cambridge, MA 02138.

Michigan. MSU Proponents of Rational Inquiry and the Scientific Method (PRISM), Dave Marks, 221 Agriculture Hall, Michigan State Univ., East Lansing, MI 48824.

Great Lakes Skeptics, Don Evans, Acting Chairman, 6572 Helen, Garden City, MI 48135.

Minnesota. Minnesota Skeptics, Robert W. McCoy, 549 Turnpike Rd., Golden Valley, MN 55416.

St. Kloud ESP Teaching Investigation Committee (SKEPTIC), Jerry Mertens, Coordinator, Psychology Dept., St. Cloud State Univ., St. Cloud, MN 56301.

Missouri. Kansas City Committee for Skeptical Inquiry, Verle Muhrer, Chairman, 2658 East 7th, Kansas City, MO 64124.

New Mexico. Rio Grande Skeptics, Mike Plaster, 1712 McRae St. Las Cruces, NM 88001.

New York. Finger Lakes Association for Critical Thought, Ken McCarthy, 107 Williams St., Groton, NY 13073.

New York Area Skeptics (NYASK), Joel Serebin, Chairman, 160 West 96 St., Apt. 11M, New York, NY 10025-6434.

Western New York Skeptics, Barry Karr, Chairman, 3159 Bailey Ave., Buffalo, NY 14215.

Ohio. South Shore Skeptics. Page Stephens, Box 5083, Cleveland, OH 44101

Pennsylvania. Paranormal Investigating Committee of Pittsburgh (PICP), Richard Busch, Chairman, 5841 Morrowfield Ave., #302, Pittsburgh, PA 15217.

Delaware Valley Skeptics, Brian Siano, Secretary, Apt. 1-F, 4406 Walnut St., Philadelphia, PA 19104.

South Carolina. South Carolina Committee to Investigate Paranormal Claims, John Safko, 3010 Amherst Ave., Columbia, SC 29205.

(continued on next page)

Local, Regional, and National Groups (Cont'd)

Texas. Houston Association for Scientific Thinking (HAST), Steven Schafersman and Darrell Kachilla, P.O. Box 541314, Houston, TX 77254.

North Texas Skeptics, Eddie Vela, Secretary and Treasurer, P.O. Box 22, Arlington, TX 76004-0029.

West Texas Society to Advance Rational Thought, Co-Chairmen: George Robertson, 516 N Loop 250 W #801, Midland TX 79705; Don Naylor, 404 N. Washington, Odessa, TX 79761.

Washington. Northwest Skeptics, Philip Haldeman, Chairman, T.L.P.O. Box 8234, Kirkland, WA 98034.

West Virginia. Committee for Research, Education, and Science Over Nonsense (REASON), Dr. Donald Chesik, Chairperson, Dept. of Psychology, Marshall University, Huntington, WV 25701.

AUSTRALIA. National: Australian Skeptics, Barry Williams, Chairman, P.O. Box 575, Manly, N.S.W. 2095.

Regional: Australian Capital Territory, P.O. Box 555, Civic Square, 2608.

Queensland, 18 Noreen Street, Chapel Hill, Queensland, 4069.

South Australia, P.O. Box 91, Magill, S.A., 5072.

Victoria, P.O. Box 1555P, Melbourne, Vic., 3001.

West Australia, 25 Headingly Road, Kalamunda, W.A., 6076.

BELGIUM. Committee Para, J. Dommanget, Chairman, Observatoire Royal de Belgique, Avenue Circulaire 3, B-1180 Brussels.

CANADA. National: James E. Alcock, Chairman, Glendon College, York Univ., 2275 Bayview Avenue, Toronto, Ontario.

Regional: British Columbia Skeptics, Barry Beyerstein, Chairman, Box 86103, Main PO, North Vancouver, BC, V7L 4J5.

Manitoba Skeptics: President Bill Henry, 205-170 Marion Street, Winnipeg, Manitoba, R2H 0T4.

Ontario Skeptics, Henry Gordon, Chairman, P.O. Box 505, Station Z, Toronto, Ontario M5N 2Z6.

Quebec Skeptics: Raymond Charlebois, Secretary, C.P. 96, Ste-Elisabeth, Quebec, J0K 2J0.

FINLAND. Society for the Scientific Investigation of Claims of the Paranormal, Prof. Seppo Kivinen, Chairman, Dept. of Philosophy, Univ. of Helsinki, Unioninkatu 40 B, 00170 Helsinki 17.

FRANCE. Comité Français pour l'Etude des Phénomènes Paranormaux, Dr. Claude Benski, Secretary-General, Merlin Gerin, RGE/A2 38050 Grenoble Cedex.

INDIA. National: B. Premanand, Chairman, 10, Chettipalayam Rd., Podanur 641-023 Coimbatore Tamil nadu.

Regional: Bangalore, Dr. H. Narasimhaiah, President, The Bangalore Science Forum, The National College Buildings, Basavanaguidi, Bangalore-560-004.

(A number of other organizations work with the National group. Contact B. Premanand for details.)

IRELAND. Irish Skeptics, Dr. Peter O'Hara, Convenor, P.O. Box 20, Blackrock, Dublin.

MEXICO. Mario Mendez-Acosta, Apartado Postal 19-546, Mexico 03900, D.F.

NETHERLANDS. Stichting Skepsis, Rob Nanninga, Secretary, Westerkade 20, 9718 AS Groningen.

NEW ZEALAND. New Zealand Skeptics, Phil Bradley, Box 10-428, The Terrace, Wellington 4.

NORWAY. K. Stenodegard, NIVFO, P.O. Box 2119, N-7001, Trondheim.

SOUTH AFRICA. Assn. for the Rational Investigation of the Paranormal (ARIP), Marian Laserson, Secretary, 4 Wales St., Sandringham 2192.

SPAIN. Alternativa Racional a las Pseudosciencias (ARP), Luis Alfonso Gámez Domínguez, Secretary, c/o el Almirante A. Gaztañeta, 1-5º D. 48012 Bilbao.

SWEDEN. Vetenskap och folkbildning (Science and People's Education), Sven Ove Hansson, Secretary, Sulite Imavägen 15, S-161 33 Bromma

SWITZERLAND. Conradin M. Beeli, Convenor, Mühlemattstr. 20, CH-8903 Birmensdorf.

UNITED KINGDOM. British Committee, Michael J. Hutchinson, Secretary, 10 Crescent View, Loughton, Essex 1G10 4PZ.

British and Irish Skeptic Magazine, Editors, Toby Howard and Steve Donnelly, 49 Whitegate Park, Flixton, Manchester M31 3LN.

Regional: Manchester Skeptics, Toby Howard, 49 Whitegate Park, Flixton, Manchester M31 3LN.

WEST GERMANY. Society for the Scientific Investigation of Para-Science (GWUP), Amardeo Sarma, Convenor, Postfach 1222, D-6101 Rossdorf.

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Subcommittees

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Legal and Consumer Protection Subcommittee: Chairman, Mark Plummer, CSICOP, Box 229, Buffalo, NY 14215-0229.

Paranormal Health Claims Subcommittee: Co-chairmen, William Jarvis, Professor of Health Education, Dept. of Preventive Medicine, Loma Linda University, Loma Linda, CA 93350, and Stephen Barrett, M.D., P.O. Box 1747, Allentown, PA 18105.

Parapsychology Subcommittee: Chairman, Ray Hyman, Psychology Dept., Univ. of Oregon, Eugene, OR 97402.

UFO Subcommittee: Chairman, Philip J. Klass, 404 "N" Street S.W., Washington, D.C. 20024.

The Committee for the Scientific Investigation of Claims of the Paranormal

The Committee for the Scientific Investigation of Claims of the Paranormal attempts to encourage the critical investigation of paranormal and fringe-science claims from a responsible, scientific point of view and to disseminate factual information about the results of such inquiries to the scientific community and the public. To carry out these objectives the Committee:

- Maintains a network of people interested in critically examining claims of the paranormal.
- Prepares bibliographies of published materials that carefully examine such claims.
- Encourages and commissions research by objective and impartial inquiry in areas where it is needed.
- Convenes conferences and meetings.
- Publishes articles, monographs, and books that examine claims of the paranormal.
- Does not reject claims on a priori grounds, antecedent to inquiry, but rather examines them objectively and carefully.

The Committee is a nonprofit scientific and educational organization. THE SKEPTICAL INQUIRER is its official journal.